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Nurses' Knowledge and Attitudes Towards Pain Management

A Literature Review

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Abstract

Pain is one of the main reasons patients seek help from healthcare professionals and yet research and statistics show that it still remains undertreated. One of the major reasons for this is nurses lacking enough knowledge regarding pain and/or having poor attitudes towards it. The aim of this study is to gain new knowledge and deeper understanding on the topic nurses' attitude and knowledge towards pain assessment and management to understand the changes in nursing knowledge and attitudes over time and in different countries.

To do this, a systematic literature review was conducted. Following a detailed and systematic process, 13 research articles were selected from 4 databases (CINAHL, MEDLINE, PubMed, and Google Scholar). These articles from different countries and different years of publishing were studied in detail and compared together to determine - What are nurses' level of knowledge and attitudes towards pain management comparatively in different countries?; What developments can be found in nurses' knowledge and attitudes towards pain management over time (1995-2020)?; What are the major areas of misconception regarding pain among nurses?

The results showed that nurses in all regions studied had poor knowledge and attitudes towards pain, except Chicago. Regions in the United States tended to have better knowledge and attitudes towards pain. A positive and gradual improvement could be seen in all regions studied, in terms of knowledge and attitudes towards pain, over time. The major areas of misconception regarding pain were related to pharmacological and non-pharmacological interventions, pain assessment. It is recommended that further research of this kind be conducted in more countries, and nursing education and training especially be improved.

Language: English Key words: Pain, Pain Assessment, Pain Management, Nurses' knowledge and attitudes, Systematic Literature Review

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1 Introduction

Pain is known to be the main symptom that leads people to seek out help from healthcare professionals as it hampers their physical, emotional and spiritual wellbeing (Samarkandi, O., 2018). For this reason, pain is a very important subject regarding which new policies and guidelines for its management have been published since the 1980s (Joranson & Gilson, 1998; McCaffery & Ferrell, 1995). Despite all this, however, studies dating back to 1999 argue that pain has still been quite poorly managed (McCaffery & Pasero, 1999).

Pain itself is a subjective and qualitative concept and despite using different tools for assessing pain available nowadays, it is very challenging to measure. It is the responsibility of healthcare professionals, and therefore nurses, to effectively assess and manage pain to the best of their capabilities. Nurses play a vital role in the assessment, planning, interpretation, intervention and pain evaluation in pain management, so it is very important that they are properly educated and knowledgeable about pain assessment and management techniques. It is important that nurses do not hold onto any false beliefs or myths about pain, which can lead to ineffective pain management (Kwon, 2014).

There exist a number of barriers to effective pain management and these barriers may be patient/client barriers, health care provider barriers, or health care system barriers. While sources indeed discuss the patient related barriers such as fear of addiction, worries about side effects, concerns about being a "good" patient, cultural beliefs etc., health care providers' barriers to adequate pain management are also a topic of frequent discussion. Under this, knowledge and attitudes towards pain are commonly highlighted as the most major barriers of concern (Potter & Perry, 2005, p.1265).

Over the years, many studies have been conducted regarding nursing knowledge and attitude towards pain management, and many organizations such as the ASPMN (American Society for Pain Management Nursing) for example, have started increasing awareness of the need for proper nursing education and awareness on pain management (painmanagementnursing.org, n.d.).

Several studies and published reports (e.g. Charap, 1978; Dalton, 1989; Marks & Sachar, 1973; Weis et al., 1983; Davitz & Davitz, 1981; Fox, 1982; Goodwin, Goodwin, & Vogel, 1979; Myers, 1985; Rankin & Snider, 1984; Watt-Watson, 1987; Kwon, 2014; Bartoszczyk & Gilbertson-White, 2015; Samarkandi, 2018) have been conducted over the years, that try

to describe the barriers to effective pain management, and the results have shown that insufficient knowledge and negative attitudes regarding pain management prove to be the largest obstacles that hurdle the implementation of effective pain management. For this reason, I believe it is very important that more research be done related to nurses' knowledge and attitudes on pain management to better understand the root of the problem and to create more awareness among nurses and other health care professionals so better service may be provided to patients.

Research has been conducted in many different countries throughout the years regarding pain management and nursing attitudes and knowledge regarding this. While all the studies have the same main topic that is nurses' attitude and knowledge towards pain assessment and management (Abbreviated as NAKPM in the rest of this thesis), they all take different approaches or focus on different aspects of this topic: some of the studies took a general overview of their country's NAKPM (e.g. Samarkandi, 2018; Eid, Manias, Bucknall & Almazrooa, 2014; Lui, So & Fong, 2014; Qadire & Al Khalaileh, 2014; Mathews & Malcolm, 2007; Nasar, Sinwan & Bee, 2005; McCaffery & Ferrell, 1997; Al Shaer, Hill & Anderson, 2011; Visentin, Trentin, de Marco, & Zanolin, 2001), some selected specific variables to study such as: different fields of nursing e.g. oncology nurses (such as Eaton, Meins, Mitchell, Voss, & Doorenbos, 2015; Alqahtani & Jones, 2015; Kassa & Kassa, 2014; De Silva & Rolls, 2011; Yildirim, Cicek & Uyar, 2008; Alqahtani, 2017; Jho, Kim, Kong, Kim, Choi, et al, 2014: McCaffery & Ferrel, 1995: Rushton, Eggett, & Sutherland, 2003), paediatric nurses (e.g. Ramira, Instone, & Clark, 2016; Pereira Dames et al., 2016; Van Hulle Vincent, 2005), emergency care nurses (Tanabe & Buschmann, 2000; Moceri, Drevdahl, & Tacoma, 2014; Tsai, Tsai, Chien, & Lin, 2007;Puntillo, Neighbor, & O'Neil, 2003), intensive care unit nurses (e.g. Wang & Tsai, 2010), etc.; or different experience levels of nursing e.g. some studies used both nursing students and registered nurses in their research sample, while others focused only on nursing students (such as Sheehan, Webb, Bower, & Einsporn, 1992; Diekmann & Wassem, 1991; Ferrel, McCaffery, & Rhiner, 1992; Plaisance & Logan, 2006; Lobo & Martins, 2013; Al-Khawaldeh, Al-Hussami & Darawad, 2013) or only on registered nurses. Even though all these studies have different focuses or approaches, they all come to similar conclusions or discuss similar themes and highlight similar problems, which is why I believe it is important that all this information be studied collectively to get a wider understanding on the topic.

2 Aim

The aim of this study is to gain new knowledge and deeper understanding on the topic nurses' attitude and knowledge towards pain assessment and management to understand the changes in nursing knowledge and attitudes over time and in different countries.

2.1 Research Questions

- What are nurses' level of knowledge and attitudes towards pain management comparatively in different countries?
- What developments can be found in nurses' knowledge and attitudes towards pain management over time (1995-2020)?
- What are the major areas of misconceptions regarding pain among nurses?

3 Background

In order to understand this topic, it is important to gain a proper understanding of the definitions of important terminology used and established factual information about the topic as a whole. This section seeks to break down the main topic, that is pain management, into its different components – pain, pain assessment, and finally treatment/management.

3.1 What is Pain?

Pain, as explained earlier, is a subjective response to physical and psychological stressors. It is a personal experience that can be described as pervasive and that is seen in all settings of health care. Increased healthcare costs, loss of productivity and an adverse impact on quality of life, are some of the problems associated with pain. However, pain as a stimulus, also serves as protection to us by warning of us of potential threats to our health. As a result of this, pain is known as the fifth vital sign, and it is recommended that pain is assessed with the other vital signs (blood pressure, pulse, oxygen saturation and temperature) (Le Mone et al, 2015; Registered Nurses' Association of Ontario, 2013; Penrose, S., 2019).

However, before getting to the point of being acknowledged as the fifth vital sign, pain as a concept has undergone a 2000-year-long evolution where the way it has been understood, perceived and defined has changed. These various hypotheses about pain that have formed

and evolved over the course of history have shaped the practices of pain management that exist today. (Donovan, 1989) The oldest reference to pain known today is from the Bible's Old Testament in the book of Genesis where God is quoted to have said to Eve "I will greatly multiply your pain in childbearing; in pain you shall bring forth children..." (Genesis 3:16; Donovan, 1989). This is noted to have provided the link between pain and punishment which has persisted in history and even became the backbone of the law in many countries during the 16th century. Just like the field of Law and politics, the philosophies of medicine and health care in the oldest medical institutions, which provided the foundation for health care today, were also influenced by this biblical implication that pain and suffering are linked, and that they should be endured as they were the will of God. Pain relief was treated as interfering with God's will (Donovan, 1989). Pain was seen in a spiritual sense rather than something physical. Even Greek philosophers such as Plato and Aristotle in the 4th century B.C. are reported to have perceived pain not as a physical sensation but an emotion experienced by the heart and not the brain (Dallenbach, 1939; Donovan, 1989). Such beliefs have even carried forward among people belonging to certain religious groups, and as a result still affects pain management.

Following this, the next theory regarding pain was developed by René Descartes in his "Treatise of Man" (1664) where he stated that the human body was more like a machine. He stated pain to be a disturbance which travelled down nerve fibres to the brain (Dallenbach, 1939; Melzack & Katz, 2004). This resulted in a philosophy that compared pain with the ringing of a bell. Descartes stated that the purpose of pain was to warn the person suffering from it of potential danger/ harm (Donovan, 1989). This school of thought has reportedly affected contemporary therapies, e.g. the misconception noted especially in emergency care that administering pain relief/ analgesics to patients with certain symptoms would mask pain and interfere with the diagnosis (Donovan, 1989).

Aristotle's theory of pain as an emotion began to garner attention and emerge again in the early 1960s and debates regarding whether certain types of pain were primarily psychogenic or primarily somatic in nature led to the development of pain assessments to understand which part of pain was psychogenic and which was somatic. As a result, professionals, who defined pain from a psychosocial perspective rather than a biochemical framework, began the use of therapies such as relaxation, imagery, hypnosis, biofeedback etc. (Donovan, 1989; Davitz & Davitz, 1981; Sternbach, 1974).

Pain began being defined as "the transfer of an impulse from one nerve fibre to another along a complex course of peripheral receptors to the brain." in the 19th century when anatomy was an emerging science (Donovan, 1989; Willis, 1985). By the end of the 19th century, pain was an ignored ailment as it could not be quantified or described biochemically (Donovan, 1989). In 1965, Melzack and Wall published a theory called "Gate Control Theory of Pain" in the article "Pain Mechanisms – A New Theory" to challenge existing knowledge on pain. Their theory suggested the existence of mechanisms by which physiology and psychology interacted together to affect an individual's pain perception. Research led to the discovery of neurotransmitters, specific receptor sites, and pain transmitting nerve fibres which in turn led to new therapeutic interventions e.g. various neurosurgical procedures which involved manipulation of various pain transmission sites, transcutaneous electrical nerve stimulation (TENS), massage, acupuncture, acupressure, and the number of different analgesics available multiplied in an effort to discover an analgesic which would bind to the correct receptor sites while avoiding morphine side effects (Donovan, 1989; Melzack & Wall, 1965; Pert & Snyder, 1973; Perl, 1985).

In 1968, Margo McCaffery explained that pain is whatever the person experiencing it says it is and exists whenever the person says it does (McCaffery, 1968; Mann & Carr, 2006).

In 1970 acute pain was given a separate definition from chronic pain for the first time. In 1974, the International Association for the Study of Pain (IASP) was incorporated. (Donovan, 1989; International Association for the Study of Pain, 1986)

As a result of this long history of discoveries, theories and definitions regarding pain, modern experts of pain therapy support the belief that *"the mind and body interact invisibly in the production and perception of pain"*. (Donovan, 1989). As such, in 1979, the International Association for the Study of Pain released the following definition of pain which is considered the most widely used definition of pain to this date: *"an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage."* (International Association for the Study of Pain, 1986)

In 2018, the IASP organized a multinational presidential task force comprised of 14 members, all experts in pain to revise the 1979 definition of pain. (Cohen, Quintner & van Rysewyk, 2018) In 2020, the revised and updated definition of pain is:

"An unpleasant sensory and emotional experience associated with, or resembling that associated with, actual or potential tissue damage." (Raja et al., 2020)

3.1.1 Types and Characteristics of Pain

Pain comes in different forms, and can be characterized by its duration, source, location, and referral. Some of the most common categories of pain are briefly described below:

- Acute Pain

  This type of pain often has a sudden onset, is localised, and self-limited. The causes usually involve injured tissues from trauma, surgery or inflammation. Acute pain may radiate to other regions of the body after onset, but it is relieved through healing of the damaged tissues. Acute pain is the main type of pain that acts as a warning sign of potential or actual harm to body tissues, and which triggers the fight-or-flight autonomic stress response from the body (Le Mone et al, 2015; Mann & Carr, 2006; Berman, Snyder, Kozier, & Erb, 2012).

- Chronic Pain

  Chronic pain is recognized for being prolonged in duration and for persisting even after the illness causing it has been treated successfully. This type of pain, however, does not always have an identifiable cause. It can be divided into 3 categories: Recurrent acute pain; chronic malignant pain which is caused by the advance of a life-threatening disease or condition e.g. cancer; and chronic non-malignant pain which is not life threatening but persists beyond the expected time of healing, e.g. lower back pain in nurses is a very common problem. Unlike with acute pain, in chronic pain, the vital signs of the patient will likely not fluctuate to reflect any disturbance (Le Mone et al, 2015; Berman, Snyder, Kozier, & Erb, 2012). Patients with chronic pain often go into depression, since having to endure continuous pain has considerable emotional and social impact. With chronic pain, it is important to not only consider the patient's physical and emotional wellbeing but also the psychosocial consequences to the patient and their relatives as a result of this pain (Mann & Carr, 2006).

- Breakthrough Pain

  This is pain that goes beyond the baseline of chronic pain and is usually described as a sudden flare that overpowers the analgesic effect of long-lasting pain medications (i.e. it is not alleviated or relieved by the patient's regular pain management plan). The pain may be malignant or non-malignant in origin, treated or untreated, but it is

always temporary and can be debilitating to the affected patient. The onset and intensity of the pain varies, is unpredictable and a cause for distress in the patient (Le Mone et al, 2015; Mishra, Bhatnagar, Chaudhary, & Rana, 2009; Caraceni et al., 2012).

- Nociceptive Pain

  This is pain that is caused by stimulation of peripheral or visceral pain receptors. It may be acute or chronic and is generally localised and responsive to treatment. It usually results from disease processes, trauma in tissues, and medical treatment (Le Mone et al, 2015; Mann & Carr, 2006; Urch & Suzuki, 2008).

- Neuropathic Pain

  Pain as a result of damage to peripheral and/or central nerves (Mann & Carr, 2006). Neuropathic pain occurs as a result of a lesion or disease affecting the somatosensory system (D'Arcy Zolla, p.61). It may be acute or chronic, the latter being the case usually. It is associated with for example, diabetic neuropathy or postherpetic neuralgia. Pain may occur with stimulus such as touch that does not normally cause pain, or the intensity may be disproportionate to the stimulus (Le Mone et al, 2015; Paice, 2003).

- Central Pain

  When there is a lesion or damage in the brain or spine, the resulting spontaneous generation of impulses perceived as pain is called central pain. Examples of conditions that result in central pain may include traumas, tumours, infarctions, or disorders such as multiple sclerosis or epilepsy. The problem with this type of pain is that it is constant, and the intensity may vary from moderate to severe, and it is difficult to treat. It is usually described as being a burning, pressing, lacerating or aching sensation. Pins and needles sensations may also be experienced with the underlying pain. Numbness may result in affected areas as well. One type of central pain to note is Thalamic pain, which can cause hyperesthesia on the side opposite to the thalamic lesion. Hyperesthesia is a condition where the affected person has an abnormal sensitivity to touch, pain, or other sensory stimuli (Le Mone et al, 2015).

- Phantom Limb Pain

  This refers to the pain syndrome experienced by a patient who has undergone amputation. It is often described as a burning, cramping, or shooting sensation in the missing limp or part (Le Mone et al, 2015). If this pain continues over a long period of time, certain intact parts of the body may become sensitized so that touching them evokes pain in the phantom limb (Kooijman, Dijkstra, Geertzen, Elzinga, & van der Schans, 2000; Wall & Melzack. 1996).

- Somatic Pain

  Pain exclusive to the musculoskeletal system or connective tissues of the body wall. When this pain also originates from the skin or subcutaneous tissues, it is referred to as superficial somatic pain or cutaneous pain. This type of pain is easy to locate and increases with direct contact (Mann & Carr, 2006).

- Visceral Pain

  Pain originating from internal organs e.g. stomach, bowel, uterus, gall bladder, etc.It is dull, difficult to locate and results in the sufferer feeling sick. Distension, spasms, twisting, chemical irritation (food poisoning), inflammation, ischaemia, etc are some forms of discomfort that cause visceral pain (Mann & Carr, 2006; Berman, Snyder, Kozier, & Erb, 2012).

3.1.2 Myths and Misconceptions about Pain

There are many beliefs regarding pain, many of which have traditional roots. It is important that nurses and healthcare professionals are educated properly so that such beliefs do not come in the way of treating a patient appropriately. Some of these myths and misconceptions about pain are explained below (Le Mone et al, 2015, p.152; Canaday & Mays, n.d.).

"Pain is a result, not a cause." Traditionally, pain is viewed as a symptom and not a condition of its own. Nowadays, pain is recognized to have both immediate and long-term effects e.g. immobility, anger, and anxiety. Pain is also a factor that may slow down healing and the process of rehabilitation (Le Mone et al, 2015, p.152).

"Chronic pain is really a masked form of depression." This statement is false because depression and chronic pain are not mutually exclusive – they can coexist. The reason for this is that serotonin is involved in pain transmission and also plays a major role as a

modulator in depression, meaning that chronic pain and depression are in fact chemically related. Similarly, the belief that chronic pain is simply psychological in nature is also false (Le Mone et al, 2015, p.152; Potter & Perry, 2005, p.1224-1228).

"Narcotic medication is too risky to be used in chronic pain." This is one misconception that is very common among professionals, and this is very problematic since it means that patients do not receive the most effective source of pain relief. The fact is that Opioid/ narcotic analgesics are recognized to be the appropriate strategy for managing chronic pain where other methods of managing this pain has failed (Le Mone et al, 2015, p.152; Potter & Perry, 2005, p.1224-1228).

"It is best to wait until a patient has pain before giving medication." Relieving pain before it escalates has a noticeable effect on the amount of pain the patient experiences, which is why in many cases where it is established that a patient has pain or is at high risk of it, having a prescribed pain medication routinely is the proper approach (Le Mone et al, 2015, p.152).

"Many patients lie about the existence or severity of their pain." This brings us back to the previously mentioned statement. "All pain is real" and "only the person experiencing it can describe it". While there are cultural influences on how different patients may report pain, very few patients lie about their pain, and it is a nurse's duty to consider everything the patient says and ensure to document the pain exactly as the patient has reported it (Le Mone et al, 2015, p.152; Potter & Perry, p.1224-1228).

"Pain relief interferes with diagnosis." It has been proven that effective pain treatment with analgesics in the emergency room has no impact on the physical assessment or diagnosis of the patient (Le Mone et al, 2015, p.152).

"Drugs are the best way to relieve pain." While pain medications are definitely a very effective way of managing pain, there are a number of other non-pharmacological methods that should be incorporated into the pain management plan, including psychosocial and mechanical methods. Introducing these methods early on during pain management helps give the patient a sense of control over their own treatment and pain management (Canaday & Mays, n.d.).

"Many patients, especially those given opioids, will exhibit 'drug-seeking' behaviour." Five very different conditions – addiction, diversion, pseudo-addiction, obsessive-compulsive disorder, and somatoform disorder – all of which are associated with 'drug-seeking

behaviour' but are diagnosed differently (Canaday & Mays, n.d.; Potter & Perry, 2005, p.1224-1228).

"You should always begin treating pain with the lowest level on the analgesic ladder (acetaminophen/nonsteroidal anti-inflammatory drug, i.e. NSAID), then slowly work your way up to opioids." The initial choice of pain medication is not simply the 'lowest level on the analgesic ladder', but is chosen after carefully considering the characteristics of the pain, its intensity, and the individual patient, in order to choose an agent that is as effective as possible. The analgesic ladder published by WHO in 1990 definitely plays a role in prescribing this chosen pain medication in combination with the 0 to 10 pain assessment scale. A patient with 0 to 3 on the pain scale has mild pain, 4 to 6 has moderate pain, 7 to 10 has severe pain. These categories determine what level of the analgesic ladder is used (Canaday & Mays, n.d.).

"Prescribing a potent pain medication such as morphine should take care of a patient's pain." Prescribing an appropriate pain medication does not eradicate pain permanently. The purpose of pain management is to prevent or reduce the pain, improve function, improve mood and sleep patterns, and anticipation and treatment of side effects, among others. These vary from person to person (Canaday & Mays, n.d.; Potter & Perry, 2005, p.1224-1228).

"The only medication needed to control a patient's pain is an appropriately dosed opioid." To achieve effective pain relief, patients will more often than not, require adjunct medications in combination with an opioid agent, such as NSAIDs, cyclooxygenase-2 (COX-2) inhibitors, antidepressants, anticonvulsants, and stimulants (Canaday & Mays, n.d.; Potter & Perry, 2005, p.1224-1228).

"You must be very cautious in prescribing and dispensing opioids because they are associated with addiction, respiratory depression, tolerance, nausea, sedation and cognitive impairment, constipation, and regulatory concerns." Fears of patients becoming addicted are overexaggerated and do not provide an excuse for not managing a patient's pain effectively. Patients in pain who are being medically managed and receiving pain relief treatment, do not become addicted. Similarly, while respiratory depression is a possible consequence of opioid usage, if the patient is prescribed the appropriate dose as per their pain, this will not occur. Tolerance is a possibility, but patients' ratings of pain vary every day and this may be as a result of changes which are ongoing. Progression of disease in for example cancer patients, may also be a reason for why they need a higher dose as treatment proceeds. Nausea is also a possible consequence, but it can be prevented easily using anti-

emetics during the first 3-4 days. In the case of sedation and cognitive impairment, patients will be tolerant to this effect, and in the case that they are not, the opioid agent can simply be changed, or a stimulant medication can be added (Canaday & Mays, n.d.).

"In general, it is best that the prescriber closely controls the use of pain medications by each individual patient rather than giving the patient control over their use." This is again negated by the fact that "only the patient knows the amount of pain they are experiencing" and they should therefore be allowed to control their pain management (Canaday & Mays, n.d.).

"If a patient is intolerant to one opioid, they will be intolerant to all opioids." Intolerance to one opioid does not mean they are intolerant to all other agents. The only important issue to be careful with when changing a patient's opioid agent is the dose conversion. To convert the dose correctly and ensure the patient does not suffer during the conversion period, the total amount used in a 24-hour period should be taken and multiplied by the appropriate conversion factor as per an opioid conversion table. The amount should then be divided by the number of doses per day based on the medicine's duration of action (Canaday & Mays, n.d.; Potter & Perry, 2005, p.1224-1228).

3.2 Pain Assessment – Holistic Nursing Care

The subjectivity of pain can make it very difficult to assess since it is such a distinct and personal experience that is influenced by multiple factors such as genetic, psychologic, physiologic, cognitive, sociocultural, cultural, and spiritual factors – and as a result, it is different for every person and also described differently by different people. Despite there being a numerous of ways to define pain and a number of descriptors of pain, nurses need to focus on the fact that pain is "whatever the person experiencing it says it is, and existing whenever the person says it does." (McCaffery, 1979). All pain is real (Fookes, C., 2019). This way of thinking, is the holistic approach revolving around patient-centred care, where it is important to understand that the patient is the only person who can accurately define and describe their own pain. This concept is what serves as the basis for nursing assessment and care of patients in pain (Le Mone et al, 2015; Registered Nurses' Association of Ontario, 2013; Penrose, S., 2019).

The Joint Commission has established pain standards that identify pain relief as a patient right. These standards dictate that health care facilities must implement specific procedures

for and provide proper education regarding pain assessment and management (Registered Nurses' Association of Ontario, 2013).

Pain assessment is a multidimensional observational assessment of a patient's experience of pain. Nurses, being in closest contact with patients, have the most important role when it comes to screening/ assessing a patient's pain. The RNAO recommendations for pain management state that pain should be assessed/ screened immediately on admission/visit of a patient, after any changes to the patient's medical status, and before/after any medical procedures (Prenrose, S., 2019).

3.2.1 Pain Screening

First and foremost, it is vital that the nurse understands that they should ask a patient directly about pain, rather than expect or assume that the patient, relatives or caregivers will voluntarily disclose it. Since pain is such a subjective, personal experience, and the only true description of it can be provided by the patient experiencing it, it is inevitable that every patient will have a unique or different way of describing their pain. As such, they may use different terms or analogies. The American Medical Directors Association (AMDA) have created guidelines wherein outline questions, that can be used for pain assessment in patients who are able to report pain verbally, are given (Registered Nurses' Association of Ontario, 2013).

These questions include (Registered Nurses' Association of Ontario, 2013):

1. "Are you feeling any soreness or aching now?"
2. "Do you hurt anywhere?"
3. "Are you having any discomfort?"
4. "Have you taken any medications for pain?"
5. "Have you any aching or soreness that kept you up at night?"
6. "Have you had trouble with any of your usual day-to-day activities?"
7. "How intense is your pain?"

Neuropathic pain is one of the biggest challenges in pain assessment. Early screening is very important as it may take more investigation to facilitate early management. Screening

questionnaires that incorporate the person's signs and symptoms can be used to aid neuropathic pain screening. Examples of these are – Self-Report Leeds Assessment of Neuropathic Symptoms and Signs (S-LANSS) and Douleur Neuropathique 4 (DN4). Both have established reliability and validity (Registered Nurses' Association of Ontario, 2013).

If any patient screens positively for the presence or risk of any type of pain, the pain assessment should continue in a comprehensive and systematic manner, taking into consideration the patient's pain history, sensory characteristics of the pain (severity, quality, duration, features, location, and what makes it better or worse), impact of the pain on usual day-to-day activities (work, sleep, ability to experience enjoyment), psychosocial impacts on both the patient and other people around them (depression, financial, etc.), and finally any past interventions that have been successful in managing the pain before (Registered Nurses' Association of Ontario, 2013).

Another thing to consider when conducting pain assessment is the fact that different patients express themselves differently, as explained before. The more a nurse knows the patient, their characteristics, and attributes, the more precisely the nurse can assess that patient's pain. A comprehensive pain assessment is influenced by – the patient's illness or level of disability, age, developmental stage, education level, cognitive status, ability to communicate, culture, ethnicity, biology, past experiences with pain, reluctance to report pain, and even spirituality. It is not just nurses and healthcare professionals who are at risk of harbouring false beliefs or certain attitudes towards pain and its management – patients may also have such beliefs in certain myths or misconceptions or may have certain attitudes towards pain that affect how they report it. A nurse should try to take all of these factors into consideration as this will help them understand the patient better and in turn, allow a more informative and conclusive pain assessment (Registered Nurses' Association of Ontario, 2013).

3.2.2 Pain Assessment Tools

Nurses need to take a systematic approach when assessing pain. A mnemonic exists to assist nurses with this process. It is called the OPQRSTUV mnemonic and is shown in the table below. **O** stands for onset of the pain; **P** for palliating factors (i.e. what makes the pain better or worse); **Q** refers to the quality of the pain; **R** stands for both region of the pain and if there is any radiation of the pain to other regions; **S** stands for severity of the pain; **T** refers to the timing and treatment of the pain, meaning when the pain comes, does it come and go, what

current medications the patient has been using and whether they have been effective in managing the pain; **U** refers to understanding and impact of the pain, i.e., if the cause of the pain is understood, and what impact the pain has on the patient's life and the lives of people around them; finally, **V** represents values which refers to the patient's own values, views and goals about their pain and their situation. Using this mnemonic as a guide, a nurse can interview a patient to get a comprehensive understanding and assessment of the pain. A table that explains the OPQRTSUV pain assessment mnemonic is found in Appendix 1 (Registered Nurses' Association of Ontario, 2013; Schipper, T. 2019).

This type of interview and history taking, combined with a scale for numerical documentation, gives the complete picture of pain assessment. A numerical scale is the most popular and preferred form. Patients are generally asked how they would rank their pain between 0 to 10 where 0 means no pain and 10 means unbearable pain. The patient can do this by reporting their rating verbally, or sometimes by circling the chosen score (Waldman, 2007, p.200-211).

While an interview or questionnaire assessment tool may function well with patients who are able to verbally report or have the cognitive ability to fill in a form, patients who are unable to do so, or for example children, may have difficulty with this. For this reason, the faces pain scale has become a very popular tool in healthcare settings (Registered Nurses' Association of Ontario, 2013; Schipper, T. 2019). An example of what the faces pain scale could look like is found in Appendix 2 (Penrose, S., 2019).

3.3 Pain Treatment & Management

After pain has been assessed and documented, it should be treated and managed, not only with drugs, but also using non-pharmacological methods, and the drugs and methods chosen should be based on the characteristics of the pain and the individual patient. In this section, the various pharmacological and non-pharmacological methods of managing and treating pain are explained.

3.3.1 Pharmacological Methods

There are many different classes and categories of medications that may be used to relieve pain. The medication is chosen according to the characteristics of the pain, the severity and intensity of the pain, and the individual patient. The chosen drug is chosen after taking all

these into consideration and applying them on WHO's analgesic ladder (Canaday & Mays, n.d.).

The first commonly used drug type is non-opioid analgesics. These consist of the non-steroidal anti-inflammatory drugs (NSAIDs) and paracetamol (acetaminophen). NSAIDs consist of acetylsalicylic acid (ASA, aspirin), dipyrone (metamizole), among others. These make up the first rung of WHO's analgesic ladder. The disadvantages encountered with this class of pain medication is that there is a maximum dose after which there is no pain relief, and the risk of side effects (Sjøgren, Elsner and Kaasa, 2020).

Then come the opioids which are made up of weak opioids and strong opioids. In simple terms, opioids are narcotic drugs that act on opioid receptors within the cells to relieve pain. Weak opioids include for example codeine, tramadol, etc. and constitute the second rung in WHO's pain analgesic ladder. The Strong opioids include morphine, fentanyl, oxycodone, etc. They make up the third rung of WHO's pain analgesic ladder (Pain Management 101: Types of Pain and Treatment Options, 2020).

A combination of a non-opioid and a weak/strong opioid may also be used to treat pain. An example of this type of combination may be acetaminophen and hydrocodone (Pain Management 101: Types of Pain and Treatment Options, 2020).

Adjuvant treatment is also an option. This consists of medication that help with pain relief by for example relieving inflammation or improving function of other systems in the body. Examples include cannabidiol, capscucin cream, gabapentin, etc.) (Pain Management 101: Types of Pain and Treatment Options, 2020).

3.3.2 Non-Pharmacological Methods

Non-pharmacological methods, as the name suggests, are methods aimed at reducing pain or managing it without the use of medications. Some examples of these may include: Education and psychological conditioning, i.e. educating the patient and preparing them so they know what to expect, which in turn reduces stress levels in the patients considerably; Hypnosis is another more psychological method that can be done by a psychologist to alter the patient's state of consciousness so that their focus is narrowed, which reduces discomfort; comfort therapy is another method that involves for example companionship, exercise, applying heat/cold, massage therapy and use of creams, meditation, music, art,

religious counselling, changing and adjusting positioning, etc.; physical and occupational therapy may involve aqua therapy, toning and strengthening, desensitization, etc; psychosocial therapy/ counselling consists of individual counselling, family counselling and group counselling; and lastly, neurostimulation could involve transcutaneous electrical nerve stimulation (TENS), acupuncture, or acupressure (Management of Pain without Medications, n.d.).

3.3.3 Pain and Culture - Transcultural Nursing Perspective

As discussed earlier in this section, pain has numerous definitions and plenty of ways to describe it. As such, it is only natural that different people may associate different meanings with pain; this may affect that person's individual experience with pain and also determine to some extent how they react/ adapt to it (Potter & Perry, 2005, p.1239). Different cultures believe in different meanings and pursue different attitudes towards pain. Studies suggest that people learn what their culture or ethnic group believes in or considers acceptable in relation to pain, i.e. in what ways people of that culture or group are expected to react to pain (cultural norms regarding pain), and adapt accordingly (Lasch, 2000; Bernstein & Pachter, 1993). In other words, a person's culture and the different beliefs and values involved may influence how that person deals with pain.

Some of the earliest research done on cultural differences in patients' responses to pain are by Zborowski (Mann & Carr, 2006, p.28), an anthropologist who collected data from four cultural groups of Americans – Irish, Italian, Jewish, and "Old American"/ third generation Americans (sample size: 103 patients), and used this data to compare various aspects of the pain experience such as interpretation of pain, significance of pain, pain intensity, duration of pain, and quality of pain. The results showed that Irish Americans found it difficult to talk about or describe their pain, had more stoic reactions towards pain, deemphasized it and preferred to isolate themselves socially when they experienced pain. On the other hand, the Italian American and Jewish American patients were more emotive/expressive with their pain, tended to request immediate pain relief, and preferred to be around others when they were in pain. The Jewish American men, however, appeared suspicious and sceptical of the pain and its implications. Lastly, the "Old Americans" described their pain in a precise manner, were less emotive about it, and preferred to socially withdraw themselves when in pain (Zbrowski, 1952; Zbrowski, 1969). Important to note, however, is that according to peer reviewers, Zbrowski's research contained some methodological flaws, but even so, their

research is still considered a classic in regards to cross-cultural pain responses (Andrews & Boyle, 2003).

Other cross-cultural differences in pain responses have also been noted over the years. Some cultural groups in Africa and the Middle East see self-infliction of pain as an expression of mourning or grief, and some cultural groups involve pain as part of ritual practices, so toleration of that pain is seen as a sign of strength or endurance. Such things can influence the level of pain that individuals from these cultural groups are willing to tolerate (Berman, Snyder, Kozier, & Erb, 2012, p.1211).

Some Mexican Americans/ Hispanics/ Latinos view pain as a part of life and as a way to gauge how serious their illness is. Puerto Ricans are very expressive and can be loud and outspoken about their pain as a way of coping with it. Chinese values, however, value silence and as such, Chinese patients may often choose to be quiet about their pain so as to not dishonour themselves or their family. Japanese people tend to be more stoic both verbally and with their facial expressions when in pain, sometimes even refusing pain relief with the belief that enduring pain is a virtue. Filipino patients may also often refuse pain relief with the mindset that pain is the will of God. Buddhist patients, as a result of Buddhism beliefs, may believe that remaining calm when in pain allows one to reach a higher state of being (nirvana) and thus may try to be less expressive. Native Americans as well are usually quiet and stoic verbally and non-verbally, choosing to tolerate pain instead of requesting pain relief even until the point where they are physically disabled. Arab patients may believe that one's pain is a private matter to be discussed only within the family, even excluding healthcare professionals which may result in miscommunication on the patient's pain management (Purnell & Paulanka, 2008, p 71, 193, 274, 321; D'Arcy, 2009, p.5-7).

Being aware and knowledgeable about different cultures and their associated beliefs and norms may be beneficial for nurses when caring for patients, however it is very important to also ensure that nurses do not use any stereotypes or try to categorize patients purely based on what they have studied about their culture when treating them. Every patient regardless of the culture they belong to has their own individual characteristics to account for. Also, it is nearly impossible to categorize an entire ethnicity or cultural group under a hard set of rules and believe that every member of these groups will indeed display all the same characteristics (Le Mone et al., 2015; Andrews & Boyle, 2003; Potter & Perry, 2005). McCaffery, Ferrell and Pasero conducted a study published in 2000 that explained that five

out of six main factors identified by nurses as useful in assessing the suffering of a patient were influenced by the patient's culture (McCaffery, Ferrell, & Pasero, 2000).

While patient's have a set of cultural values and beliefs that affect their attitudes towards pain, nurses and healthcare professionals are also people belonging and associating themselves with some form of social group or community which inevitably risk affecting how they care for patients in pain (it may influence the pain management strategies implemented). This is most problematic, especially when the nurse's values differ greatly from the patient, as a result patient-centred care and culturally competent/sensitive care is forgone due to the nurse's own biases. The nurses may have certain expectations about pain being that research suggests nurses fall under a subculture known as the nursing subculture (Andrews & Boyle, 2003; Berman, Snyder, Kozier & Erb, 2012). Nurses and healthcare professionals must therefore aim to be as culturally aware, I.e. have the knowledge that ethnic and cultural diversity in pain expression and management exists and that they must respect that when caring for their patients (Le Mone et al., 2015; Andrews & Boyle, 2003; Potter & Perry, 2005) .

While knowledge of the existence of cultural differences when it comes to pain is essential for nurses, that alone is not enough to ensure culturally competent/ culturally sensitive care in pain treatment. The nurses must seek to understand the impact of these differences and try to include these cultural beliefs and patterns into the care plan. As per patient-centred care, the nurse must work together with both the patient and their family members to facilitate proper and clear communication regarding pain management, especially assessment. It is very important to determine which pain assessment tool is appropriate for a patient and communicate that information with other nurses/ healthcare providers who may also participate in the care of that patient (Potter & Perry, 2005, p1239).

The nurse should try to be aware of – what the patient perceives as the causal factor for their pain e.g. fate, lifestyle, punishment, witchcraft, God; whether the patient appears more stoic or expressive as this is also influenced by cultural elements; what words they use to express or describe pain e.g. hurt, ache, discomfort, as this may also depend on the patient's cultural background; the patient's past experiences with pain; how the patient defines pain; and finally, how the patient feels about pain treatment (Potter & Perry, 2005, p1239). The nurse should respect the patient by recognizing that – they may have different beliefs regarding pain and the nurse should therefore ask about these beliefs and the patient's way of coping with pain; that the patient has the right to express their pain in whichever way they choose

to, or believe to be appropriate; and finally, that there are multiple different ways of expressing pain which vary greatly and as such, there is no "good" or "bad" way of expressing pain (Potter & Perry, 2005).

4 Theoretical Framework

Katharine Kolcaba's Comfort Theory combined with Jean Watson's Theory of Transpersonal Caring will provide the conceptual framework for this thesis. A theory in nursing research can be defined as *"organizing structures of our reflections, observations, projections and inferences"* (Parker & Smith, 2010, p.7; Carol Boswell). Research, is defined by Polit and Beck (2008) as *"a systematic inquiry that uses disciplined methods to answer questions or solve problems."* (Polit & Beck, 2008, p.3). With that in mind, theories can be considered evidence, as stated by Fawcett and Garity (2009). The theory acts as evidence to guide practice. Therefore, it can be stated that theory gives direction to research which in turn provides guidance for practice. This is why having a theoretical framework is valuable in research such as in this thesis to guide the research and provide implications for nursing practice. The theories used are intended to make the findings of this research more meaningful, to integrate the knowledge gained into coherent systems, to stimulate further research, and to explain the relationships and phenomena among them. Two theories were chosen to provide framework to different aspects of this research in order to form a unified, comprehensive result.

The two theories in question are further explained in this section, as well as critiqued briefly using the Chinn and Kramer's criteria for evaluating and analysing a nursing theory, I.e. assessing clarity, generality, simplicity and empirical precision (Peterson & Bredow, 2009). The relationship between the topic of interest (nursing knowledge and attitudes towards pain management, and the nursing role in pain management) with the theory of comfort and caring will also be further explained.

4.1 Katherine Kolcaba's Comfort Theory

Katherine Kolcaba's Comfort Theory is a middle-range theory (developed in the 1990s) for health practice that is based around the idea that *"nurses should comfort patients since patients would do better and nurses would feel more satisfied."* Kolcaba uses traditional nursing values, for example Nightingale's statement in 1859 – *"It must never be lost sight of what observation is for. It is not for the sake of piling up miscellaneous information or*

curious facts, but for the sake of saving life and increasing health & comfort." – concept analysis, and evidence based research to form this theory that puts the traditional nursing mission into practice (Nightingale, 1859, p.70; Peterson & Bredow, 2017, p.197).

Using ideas from three early nursing theorists, Kolcaba synthesized or derived the types of comfort in concept analysis, and they are as follows (Kolcaba, 1991; Kolcaba, 2003; Alligood, 2018, p.528; Peterson & Bredow, 2017, p.198) –

a) Relief: state of a patient who has had a specific need met

b) Ease: state of calm or contentment

c) Transcendence: state where one rises above one's problem or pain.

Each of these was synthesized from the work of the following theorists respectively – Orlando (1961), Henderson (1966), and Paterson & Zderad (1975) (Kolcaba, 1991; Kolcaba, 2003; Alligood, 2018, p.528; Peterson & Bredow, 2017, p.198).

Kolcaba then developed the idea that the types of comfort occur physically and mentally. However, the categories "physical" and "mental" were not considered holistic by her colleagues and professors at Case Western Reserve University. After studying nursing literature in order to understand the conceptualisation of holism for a year, Kolcaba derived the four different contexts of comfort, I.e. four contexts of holistic experience (Kolcaba, 1991; Alligood, 2018, p.529; Peterson & Bredow, 2017, p.198)–

a) Physical: relevant to bodily sensations and homeostasis, for example, **pain relief** or turning and positioning.

b) Psychospiritual: relevant to internal awareness of self, including self-esteem, concept, sexuality and one's life purpose/meaning; one's relation to a higher order or being e.g. God.

c) Environmental: pertaining to the external surroundings, conditions and influences.

d) Social: pertaining to interpersonal, family & societal relationships.

When the contexts of experience and types of comfort are juxtaposed, a 12-cell grid can be formed, called the taxonomic structure of comfort. This grid can be found in Appendix 3. The grid has been useful as a form of assessment for comfort needs of patients, families and

nurses; planning interventions for comfort enhancement; measuring desired outcomes of comfort enhancement for research and practice (Peterson & Bredow, 2017, p.198).

Using the above derived types and contexts of comfort and the taxonomic structure of comfort, Kolcaba's theory of comfort is summarised in the following holistic definition of comfort:

> *"Comfort is the state experienced by recipients of comfort interventions. It is the immediate, holistic experience of being strengthened when one's needs are addressed for three types of comfort in four different contexts."* (Kolcaba, 1992; Alligood, 2018, p.528-529; Peterson & Bredow, 2017, p.198).

The theory displays clarity and simplicity in that it is very basic to nursing care and the traditional goal of nursing; it has generality as it can and has been applied in numerous research settings with a vast variety of cultures and age groups; it is accessible since it has been tested and supported by multiple studies; and it has importance as it emphasizes patient-centred practice (Alligood, 2018, p.534-535).

The Comfort Theory explains that improving a patient's comfort gives patients the strength and ability to engage in health-seeking behaviours that enhances their overall wellbeing. For this reason, nursing interventions related to a patient's comfort are important and are encouraged (Alligood, 2018, p.657-669).

Fundamentally, Comfort Theory pertains the process of comfort interventions planned and implemented by a nurse for a patient. According to the Comfort Theory, patients experience comfort needs when they are in poor health especially, and while they and their family may take care of some of these needs themselves, others may remain unmet. These needs that cannot be met by the patient and family on their own, can be identified by a nurse who then designs and implements comfort measures and interventions to cater to these needs. The nurse takes intervening variables into account when designing these interventions, and when these interventions are effective and delivered in a caring manner, the patient attains enhanced comfort. Enhanced comfort readies the patient for subsequent health-seeking behaviours which further enhances comfort. As a result, patients, families and nurses can become more satisfied with health care delivery and this results in better health-related and institutional outcomes (Craig, 2014).

The theoretical framework model of the comfort theory is shown in figure 1 below:

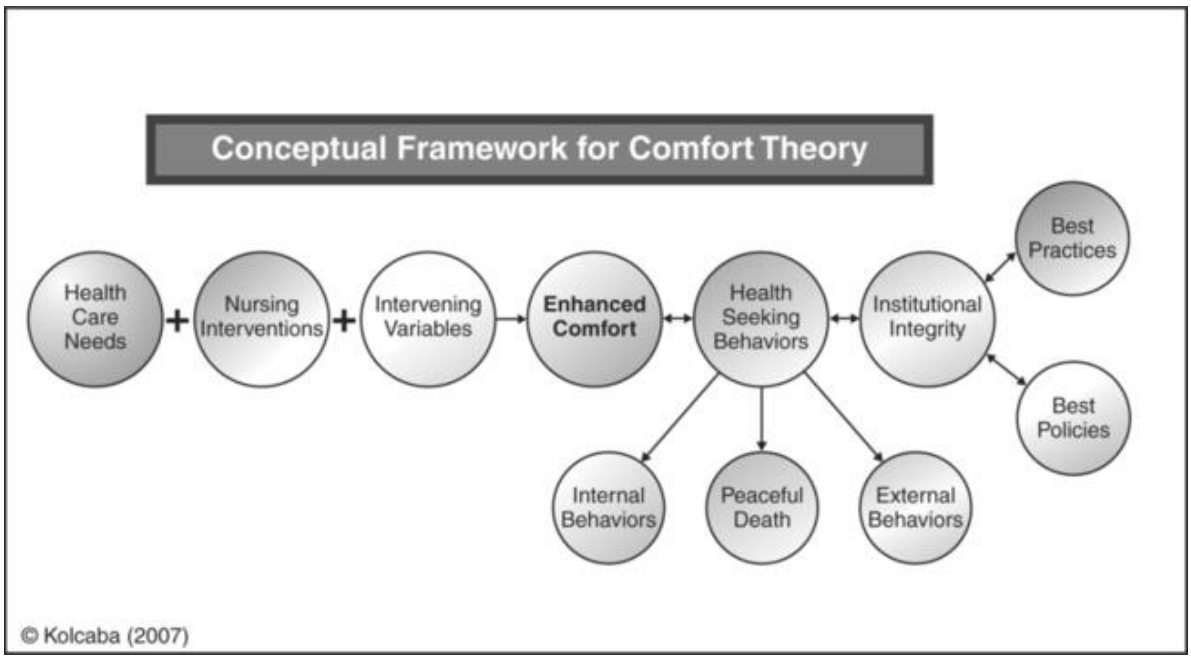

Fig. 1: Kolcaba's Conceptual Framework for Comfort Theory (Kolcaba, 2007)

In summary, pain management and Kolcaba's comfort theory go hand-in-hand. This is because comfort perspective can be used to approach pain management. The theory can be used in assessing and caring for patient's in pain (Craig, 2014). This theory is applicable to this study because patient comfort is cited as a goal in its standards of care and is an established value for nurses. Also, pain relief is stated among the contexts of comfort under the physical context. This means that pain relief is an important part of providing a patient with comfort. The taxonomic structure of comfort provides a framework for the stages of pain management – relief i.e. providing analgesics, ease i.e. using nondrug interventions to reduce pain, or educating the patient, etc., and transcendence that is aiding a patient to cope with their pain and rise above it. Also the contexts of comfort also provide different factors pertaining to a patient's pain and how a nurse can manage it: physical comfort pertains to the actual physical pain the patient has, psychospiritual could pertain to any psychological distress arising from the pain for example, environmental could pertain to anything in the patient's surroundings that could influence their pain such as type of bed or positioning, and lastly sociocultural which could pertain to the social and cultural aspects that may influence how a patient responds to pain. Kolcaba's comfort theory and the many instruments developed from it can therefore be used in evidence-based practice by nurses to provide holistic, patient-centred pain management, and was therefore a suitable theoretical framework for this thesis.

4.2 Jean Watson's Theory of Transpersonal Caring

Watson's caring theory, developed between 1975 and 1979, was initiated with the objective of providing a philosophical-ethical foundation for nursing science which would be distinct from, but complementary to medical science. An even further purpose of the research behind this theory was to give nursing as an emerging discipline meaning and focus; to distinguish nursing science as a distinct/ unique health profession with its own values, knowledge, worldview, and practices; to include within the nursing moral code/ covenant also humanity and mission to society; and finally, to assist and support the notion of global human caring, healing, and health for all. In summary, the purpose of this theory was to take emphasis from medical-clinical technological-biological phenomena and place greater focus on humanity and inner experiences of health, illness, healing and subjective needs of other, while remaining within the subjective lifeworld of patients, families and society.

Wisdom from French philosopher Emmanuael Levinas (1969) and Danish philosopher Knud Løgstrup (1995) have been stated to have provided the foundation for her research in her book "Caring Science as a Sacred Science". Using Carl Rogers and other recent authors of transpersonal psychology as references, Watson's caring theory stresses on the humanistic aspects of nursing as they merge and tangle with scientific knowledge and nursing practice. Emphasis is put on the interpersonal and transpersonal qualities of congruence, empathy, and warmth.

Watson noted that Carl Rogers' phenomenological approach and view that "nurses are not here to manipulate and control others but rather to understand" was of great significance and influential during a period when "clinicalization" (therapeutic control of the patient) was thought to be the norm.

According to Watson, the caring theory states that nursing is associated with health promotion, illness prevention, caring for the sick, and health restoration, I.e. nursing focuses on both promoting health and disease treatment. As such, Watson explains that caring is a central theme to nursing practice. The theory follows the wisdom and vision of Florence Nightingale in her model of nursing which describes nursing as a lifetime journey of caring, healing and seeks to comprehend and sustain the wholeness of the human existence, transcending time and space, and national, geographical, socioeconomic, and religious boundaries, while offering *"heart-centred, compassionate, informed, knowledgeable human caring to society and humankind"* (Smith, 2020, p 317).

Classified as a grand theory in some nursing theory books, it is also noted that Watson's theory could also be considered a philosophy, an ethic, a paradigm, an expanded science model, depending on how it is "read". If interpreted within as a philosophical theory within a unitary-transformative/ Ethic of Belonging paradigm, including the transpersonal, energetic-field level of caritas, I.e. universal love and evolving consciousness, it can indeed be treated as a grand theory. However, if "read" at the caritas process level, which gives the language and stucture of the theory, it could be also considered a middle-range theory.

The main concepts associated with Watson's caring theory are – the ten carative factors, the transpersonal healing and caring relationship, caring moment, caring occasion, caring healing modalities, caring consciousness, caring consciousness energy, and phenomenal file/unitary consciousness. The metaparadigm concepts of the theory include – the human being, health, nursing, and environment.

The ten carative factors were later expanded to Caritas. These can be seen in Table 1 below. Caritas is a word of Latin origin, meaning "to cherish and appreciate, giving special attention to, or loving." Watson provided a translation of the carative factors original created into clinical caritas processes which created open ways in which they could be considered. The caritas are important factors a nurse must consider when approaching the patient from a caring role and is vital to the human caring experience. The language of the 10 caritas processes has been deemed worldwide as valid universals of human caring.

Carative Factors and Caritas Processes

Carative Factors	Caritas Process
1. "The formation of a humanistic-altruistic system of values"	"Practice of loving-kindness and equanimity within the context of caring consciousness"
2. "The instillation of faith-hope"	"Being authentically present and enabling and sustaining the deep belief system and subjective life-world of self and one being cared for"
3. "The cultivation of sensitivity to one's self and to others"	"Cultivation of one's own spiritual practices and transpersonal self going beyond the ego self"
4. "Development of a helping-trust relationship" became "development of a helping-trusting, human caring relation" (in 2004 Watson website)	"Developing and sustaining a helping trusting authentic caring relationship"
5. "The promotion and acceptance of the expression of positive and negative feelings"	"Being present to, and supportive of, the expression of positive and negative feelings as a connection with deeper spirit and self and the one-being-cared for"
6. "The systematic use of the scientific problem solving method for decision making" became "systematic use of a creative problem solving caring process" (in 2004 Watson website)	"Creative use of self and all ways of knowing as part of the caring process; to engage in the artistry of caring-healing practices"
7. "The promotion of transpersonal teaching-learning"	"Engaging in genuine teaching-learning experience that attends to unity of being and meaning, attempting to stay within others' frame of reference"
8. "The provision of supportive, protective, and (or) corrective mental, physical, societal, and spiritual environment"	"Creating healing environment at all levels (physical as well as nonphysical, subtle environment of energy and consciousness, whereby wholeness, beauty, comfort, dignity, and peace are potentiated)"
9. "The assistance with gratification of human needs"	"Assisting with basic needs, with an intentional caring consciousness, administering 'human care essentials,' which potentiate alignment of mind body spirit, wholeness, and unity of being in all aspects of care"
10. "The allowance for existential-phenomenological forces" became "allowance for existential-phenomenological spiritual forces" (in 2004 Watson website)	"Opening and attending to spiritual-mysterious and existential dimensions of one's own life-death; soul care for self and the one-being-cared for"

Table 1: Watson's Carative Factors and Caritas Processes (Gonzalo, 2019)

The first three caritas provide the philosophical foundation for the science of caring and as such, the remainder seven are derived from them.

The transpersonal caring relationship serves as the foundation of the theory (Watson. 1999). It is a special and unique human care relationship involving the union with another person while giving high regard for the whole person and their being-in-the-world (Watson, 1999, p.63). Developing and maintaining this relationship is done by applying the ten caritas processes which guide the relationship and create the foundation for the caring-loving relationship essential to nursing practice (Watson, 2008).

Watson's theory has clarity since often paradoxically abstract and simple concepts like caring-love are hard to practice and explain, have been explained clearly and made more tangible in her theory using nontechnical, fluid, evolutionary language, as well as metaphors, artworks, and poetry. Her theory may be considered complex as it draws from multiple disciplines and may be difficult for nurses with limited background in liberal arts, especially when it comes to the existential-phenomenological nature of the theory. However, if the reader becomes familiar with the broad subject matter, it can be very easy to grasp the theory as it is presented. The scope of the theory covers broad aspects of health and illness phenomena, as such it has generality. It has, however, been criticized in how much it can be used by nurses in practice who want concrete guidelines to follow (Alligood, 2018, p.74).

As discussed with Kolcaba's theory of comfort, comfort is a subjective concept just like pain and is of great importance in nursing care, and goes hand-in-hand with pain management since pain relief is part of providing comfort. Watson's caring theory incorporates this concept of comfort, and this is why the theoretical framework of this thesis is a combination of these two theories.

As explained, Watson's caring theory puts great emphasis on the human trust and caring relationship (transpersonal caring relationship) between the nurse and patient, because this allows for the nurse to be aware of the patient's subjective world (Watson, 2007). Pain and comfort both being subjective concepts means it is essential that a nurse build this caring relationship with the patient to understand and provide the best care they can for the patient. Also this extends to the relatives of the patient in pain as well. The Caritas processes in Watson's theory give rise to therapeutic relationships which positively impacts communication between the nurse and patient heavily, and thereby results in optimal pain management. Watson's caring theory gives a holistic approach to providing comfort, thereby pain relief.

Combining Kolcaba's comfort theory and Watson's theory provides a very suitable theoretical framework to support the main topic of this thesis especially since comfort places emphasis on the patient outcomes of pain management, whereas caring places emphasis on the nursing role of pain management.

5 Method

A systematic literature review was used as the methodology for this thesis. To summarize, this type of literature review identifies, locates, selects, and critically appraises research in order to answer one or more clearly formulated research questions to establish a finding or conclusion which can then be used by expert clinicians to promote and implement evidence-based practice (Gray, Grove, & Sutherland, 2017; Craig & Smyth, 2012; Higgins & Green, 2008; MacKenzie, et al, 2012). By doing this, present knowledge on the topic (Nurses' knowledge and attitudes towards pain management and nursing role in pain management) can be updated and a foundation for further future research can be laid out (Siddaway, 2014). In other words, evidence can be pulled together to create a clean synthesis of current knowledge on the topic (Boswell & Cannon, 2017).

5.1 Systematic Literature Review

Systematic literature review summarizes available research findings on a particular topic. The process involved is always careful, rigorous, and explicitly spelled out in advance in a protocol, promoting transparency in order to reach an unbiased conclusion, and to ensure verifibility and reproducibility (Holly, Salmond, & Saimbert, 2017; Polit & Beck, 2017). Findings from relevant, previously conducted primary studies derived from a wide range of populations, settings, circumstances, study designs, etc. are comprehensively identified, critically appraised, re-analysed and synthesized, with a clear guiding research question (Holly, Salmond, & Saimbert, 2017; Coughlan & Cronin, 2017; Gray, Grove, & Sutherland, 2017; Institute of Medicine, 2011).

Siddaway (2014) explained that *"A huge amount of research is produced each year, often with conflicting findings. These differences may be due to study differences, flaws or chance (sample variation). In such situations it is not always clear what the overall picture is, or which results are most reliable and should be used as the basis for practice and policy decisions"* (Siddaway, 2014). Similarly, Hemingway and Brereton (2009) explained that we may find little insight into the problem in question when looking at individual articles,

however when put together within a systematic review, a clearer and more consistent picture will emerge (Hemingway & Brereton, 2009; Boswell & Cannon, 2017). As such, using systematic reviews, large amounts of information that has been critically appraised to be rigorous, can be collapsed into a single research article making the great amount of information more manageable and accessible for immediate use by busy health care providers, and also to researchers who can use these systematic reviews to get a clear summary of existing data and avoid duplication of prior studies (Holly, Salmond, & Saimbert, 2017). In addition, systematic reviews analyze the consistencies and inconsistencies of relationships in variables and in the findings of the studies chosen, and try to provide explanations on why they exist.

This makes systematic review a suitable methodology for the research questions guiding this thesis which seek to gain wider understanding of the topic of pain management – what developments can be found in nurses' knowledge and attitudes towards pain management in different countries? and what is the nursing role in pain management – by accumulating previously conducted studies relevant to the topic, critically appraising them, re-analyzing and then synthesizing them. After which, consistencies and inconsistencies can be noted, analyzed, and explained.

Also, findings from a systematic review have greater validity than a single individual study. Due to the broad range of the literature which can be accumulated in this type of research, the strength, generalizability, and transferability of the findings are increased, while reducing bias from random and systematic error. Polit & Beck's modified evidence hierarchy shows that systematic reviews are in fact at the top of the hierarchy (Level I) regardless of the type of research question involved, the reason being that strongest evidence results from meticulous synthesis of multiple studies (Polit & Beck, 2017). While subjectivity is impossible to completely avoid, the protocols and review process of systematic reviews are disciplined and follow a scientific method so that erroneous conclusions arising from biased review process or biased study selection can be avoided. Also, the transparency allows for readers to assess conclusions they are presented in the review (Polit & Beck, 2017).

This serves as another reason why this method was chosen for this thesis since the process behind it strives to ensure transparency, reproducibility, verifiability, objectivity, while lowering risk of bias and random error (Holly, Salmond, & Saimbert, 2017).

As the systematic literature review is in and of itself a methodical, scholarly inquiry, it applies the same level of scientific rigor to the review process and follows a lot of the same

steps as those used when conducting a primary research/study (Polit & Beck, 2017; Holly, Salmond, & Saimbert, 2017). Therefore, the systematic literature review for this thesis will proceed by first formulating the desired research questions (stated previously), selecting reliable databases and conducting the searches using suitable keywords, and finally analysing and critically evaluating the chosen relevant literature to write up the actual review (Jensen, 2018).

5.2 Data Collection

The databases used in this review were: CINAHL, Med-line, PubMed and Google Scholar. These databases were accessed using FINNA, a search engine providing unlimited access to electronic and library resources from Novia University of Applied Sciences. Literature used in this thesis were also derived through examining bibliographies of all scientific articles selected from the databases.

The PICO framework was used to determine the keywords used for searching the databases for the chosen literature. The PICO framework is an evidence-based framework that aids researchers to formulate suitable research questions, and also acts as a strategy for determining suitable search keywords that ensure proper data collection. To simplify it, PICO is a mnemonic that stands for – study **P**opulation, phenomenon of **I**nterest, **C**ontext of study in relation to the study **O**bjective, which together constitute the elements of a sound clinical foreground question. Following this strategy: the population of study was registered nurses with no particular focus on any specific area of nursing or level of experience; the phenomenon of interest was the knowledge and attitudes of these nurses towards pain management; and the context of the study included studies from all different countries around the world with no geographical limitations. The main parameters that limited any literature that otherwise may have been relevant were: lack of accessibility in full text form, and/or literature not available in English (Polit & Beck, 2017; Coughlan & Cronin, 2017; Holly, Salmond, & Saimbert, 2017; Boswell & Canon, 2017; Jensen, K., 2018; RMIT University, 2020).

Preliminary data searches were conducted in November 2019 and the most suitable keywords and phrases were selected for use in the actual search. The keywords and phrases used included – “Nurses’ knowledge and attitudes”, “pain management”, “Pain assessment”, “Pain”, “Nursing”, etc. Different combinations of these were used to form search words which were – “Nursing” AND “Nurses’ Knowledge” AND “Nurses’ Attitude” AND “Pain

Management" AND "Pain" AND "Pain Assessment". These key words and phrases determined usin the PICO framework, were used in the databases' subject headings and MeSH library to select all relevant search terms. Searches were conducted systematically using these keywords. The detailed search history of each database searched can be found in Appendix 4 and 5, with the exception of google scholar since the search history could not be obtained in a suitable format. All searches were done in English. The chosen keywords and search words used in each of the different databases is displayed in table 2, shown below.

Database	**Keywords/ Search words and phrases**	**Hits**	**Articles chosen for this study**
EBSCOhost CINAHL	((MH "Pain Management") AND (MH "Nursing Knowledge") AND (MH "Nursing Attitudes")) OR ((Nurses' Knowledge and Attitudes) AND ("Pain" OR "Pain Management"))	82	3
PubMed	(("Pain Management"[Mesh]) AND ("Nursing"[Mesh] OR "nursing" [Subheading])) AND "Health Knowledge, Attitudes, Practice"[Mesh]	133	3

EBSCOhost MEDLINE	((MH “Pain Management”) AND (MH “Nursing Knowledge”) AND (MH “Nursing Attitudes”)) OR ((Nurses’ Knowledge and Attitudes) AND (“Pain” OR “Pain Management”))	53	3
Google Scholar	allintitle: nurses knowledge and attitudes pain management pain "knowledge and attitudes"	190	4
Total		458	13

Table 2: Database Searching Process

The articles selected for this systematic literature review are listed in a table which can be found in Appendix 6. All general information about these articles, i.e. title, author(s), publication, year, aim, method and results, were included in this table.

5.2.1 Selection Criteria

In this section, the criteria used to determine the inclusion and exclusion of scientific articles for this literature review, are explained. The filters used while searching the databases included: English language and full text. In this way, only scientific articles that were available in English and that were accessible in full text were considered. These acted as the first inclusion criteria. The hits shown in table 3 are the number of hits displayed after these filters were applied on the databases.

The next criteria were set in accordance with the aim of this thesis, so that only articles that properly cater to the aim were chosen. These criteria were: the article should focus on registered nurses, not other health care professionals or students, etc., and the article should not focus on any specific field of nursing (e.g. oncology nurses only or paediatrics only, etc.), or any specific type of pain (e.g. cancer pain, postoperative pain, chronic pain, etc.). This was so that all articles gave a more general overview of the knowledge and attitudes of registered nurses in whatever country that article was based on, and prevent bias to any particular field.

Lastly, in order to ensure that all conclusions and comparisons drawn from these articles are reliable and valid, all the articles chosen are quantitative studies that use the same methodology, i.e. McCaffery and Ferrell's NKASRP survey tool.

In summary, the inclusion and exclusion criteria used can be listed as follows:

- Articles accessible in English
- Articles between the years 1995-2020
- Articles with access to full text
- Articles that are peer reviewed
- Studies that do not focus on any specific field of nursing or any particular type of pain (e.g. pediatric/ oncology/ emergency nursing; or chronic pain/ cancer pain etc.)
- Studies that focus on registered nurses and not nursing students, midwives, etc.
- Quantitative studies using the same method (McCaffery and Ferrel's NKASRP survey tool) to enable fair comparison in data synthesis

The inclusion criteria of English language, full-text, peer reviewed articles, and the year range of 1995-2020 were applied when searching all databases. The total number of hits were 458 articles as seen in table 3. All the articles were then downloaded in .ris format (Reference/Citation manager) from each of the databases, and uploaded into Mendeley Desktop, a freely accessible reference managing software. Duplicates were automatically screened out using the Mendeley merge tool, and folders were made to screen first based on title, then based on abstract, and finally based on quality. To give a clear picture on how selection criteria (inclusion and exclusion criteria) were applied when searching the

databases, and to summarize the screening process, a PRISMA flowchart can be used, as shown in figure 2 below:

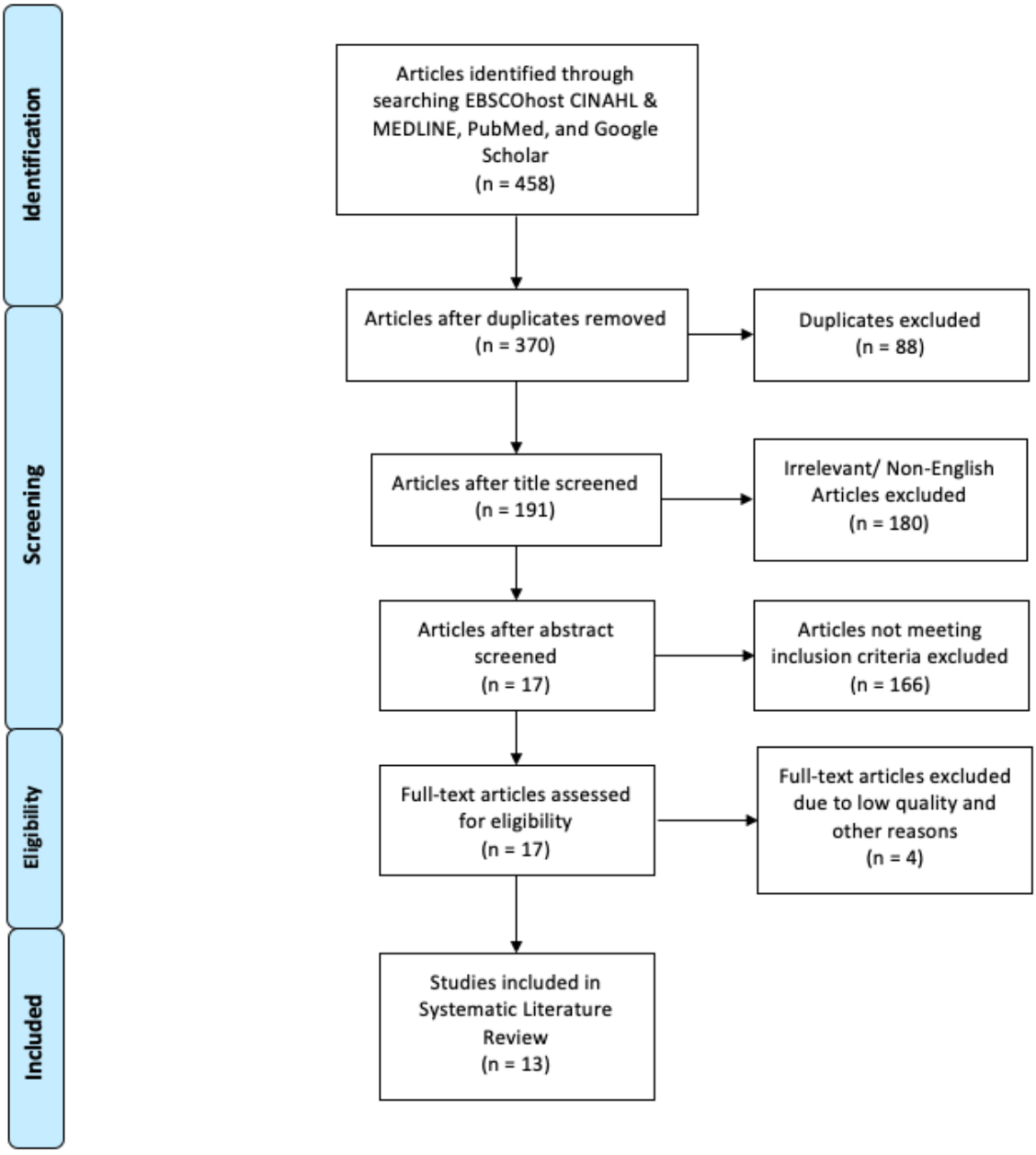

Fig. 2: PRISMA flowchart showing the search and screening process

5.3 Critical Appraisal of Chosen Literature

Quality assessment and critical appraisal of included literature was also conducted using a critical appraisal tool in the form of a checklist. To begin with four studies were excluded from the final chosen articles, two of these studies excluded were due to poor quality, the main reason being very small research population samples. All studies included have at least greater than 100 registered nurses as the sample; two studies with small samples of 50 nurses

and 42 nurses were thus disqualified. Another reason for disqualifying these studies was not enough detail in results. All studies chosen displayed results in a detailed and clear manner, including for example a table showing percentage of correctly or incorrectly answered questions, etc. and a mean score from the NKASRP survey.

The other two excluded studies were disqualified on a methodology basis since they did not use the same instrument as all other studies (McCaffery and Ferrell's NKASRP survey). This would make data synthesis unfair and difficult, and make comparison unreliable. In addition, the tool used, one of them being a 16 item questionnaire developed by Lebovits et al, has not been psychometrically tested prior to its use in the study, and does not have enough research to back it up. It has not been cited in enough literature or scientific studies prior to the study in question. No information was given about the construct or content validity, internal consistency, or test-retest reliability of this instrument to judge how valid and reliable it is.

In comparison all the chosen studies used the NKASRP survey by McCaffery and Ferrell which has been acknowledged as a suitable tool for measuring knowledge and attitudes regarding pain management with its content validity established by a panel of pain experts based on pain management guidelines from the World Health Organization (1986), American Pain Society (1992), Acute Pain Management Guideline Panel (1992), and the Agency for Health Care Policy and Research (Brown, Bowman, & Eason, 1999; Samarkandi, O, 2018). The construct validity of this tool has been established through comparison of scores of nurses with different levels of expertise e.g. students, oncology nurses, emergency care nurses, senior pain experts, etc. McCaffery and Ferrell reported the psychometric properties of this survey instrument which has been used with more than 800 subjects. The internal consistency of the tool is reported to be 0.70 and the test-retest reliability is reported to be 0.80 (Brown, Bowman, & Eason, 1999; McCaffery & Ferrell, 1999; Naser, Sinwan, & Wong, 2005; Yava et al, 2013).

Out of the 13 selected studies, three studies employed the use of a translated version of McCaffery & Ferrell's NKASRP survey. The psychometric properties of these version were reported accordingly in each study as follows: the Italian version which has been adopted in prior studies (Bernardi et al, 2007) was shown to be validated (Cronbach's $\alpha>0.69$, test-retest reliability $r=0.97$) (Latina et al, 2015); The Chinese version of the NKASRP tool translated and developed by Tse and Chan (2004) was used in two of the studies selected, the content validity index being 0.87 and the test-retest reliability being 0.81 (Tse and Chan, 2004; Lui, So, & Fong, 2008); lastly, the Turkish version was translated, developed and tested by

Brislin (1986). The content validity index was determined by an expert committee to ensure proper translation equivalence and content relevance, the content validity index was found to be 89.5% which is suitable based on Polit & Beck (2006). Also the Cronbach's alpha value was found to be 0.87 and the test-retest reliability was found to be 0.83 (Yava, 2013; Brislin, 1986).

The demographic tools incorporated by the chosen studies to display the participants' characteristics ensured anonymity was maintained and were concise, clear and displayed in detail in the results. Data analysis methods were synonymous in all research studies using quantitative, statistical methods for quantifying and analyzing results – Standard Package for Social Sciences (SPSS) was used, and results were reported in numerical and percentage format for categorical variables and as means and standard deviations for continuous variables. Also most of the studies chosen employed ANOVA (Analysis of Variation) to quantify significant differences between average NKASRP score and other variables such as education level, field of expertise, work experience, prior pain management education, etc. Spearman correlation was used to show correlation between variables. All this data was presented clear and concisely.

In terms of sample, most of the selected studies used convenience sampling or randomized sampling. Convenience sampling was used by only including results from nurses who wished to voluntarily participate in the study which lowers generalizability since nurses who did not participate may provide different results. Sampling bias may also be a concern since with this method, it is possible that only nurses interested in the topic and thus who might be more knowledgeable would participate in the survey and influence results. Additionally, most of the studies involved using a sample population from only one hospital which again limits generalizability, however some studies also incorporated other hospitals. In general, however, all studies had large enough sample sizes to ensure data is as varied to enhance representativeness as much as possible. From an ethical standpoint as well, allowing voluntary participation is a suitable method for gathering data. All the studies employed methods of reducing bias by keeping researcher from influencing participant responses in any way, or by limiting participants using a certain bias. Survey results were also collected using a hands-off method by the researcher. In this way, the sampling methods used by the chosen studies were acceptable.

Ethical considerations were properly displayed and explained in all chosen studies. Participants voluntarily participated in the survey (they were given the right to refuse and withdraw) and were given information and enough clarity in how to fill the survey. Surveys as explained earlier were translated in studies conducted in non-english countries to ensure participants understood the survey properly and could answer it in their own fluent language. In addition, consent forms were provided and anonymity was ensured in all the studies. All studies also report seeking permission from hospital board or ethical committee in the respective hospitals where the research studies were conducted.

5.4 Data Analysis

Since the articles chosen are all quantitative studies, but do not favor the use of meta-analysis as the study designs are not homogenous enough, narrative integration synthesis was chosen as the method for synthesizing the data. Narrative synthesis aims to generate new insights or knowledge on a topic (Mays et al., 2005) by encompassing an analysis of the relationships within and between studies, while also giving an assessment of the strength and validity of the evidence (CRD, 2009; Coughlan & Cronin, 2017).

The data was first summarized to outline all the results, and present the findings and conclusions of each individual scientific article. These were presented in tabular form as found in Appendix 6. The identified results and conclusions of the chosen studies were then compared together, and the results/ conclusions drawn from these comparisons were categorized and presented using tables and graphs so that they are explained as clearly as possible in the form of narrative synthesis. From these, a final conclusion was then drawn, and a discussion developed in an integrative manner (Polit & Beck, 2017; Holly, Salmond, Saimbert, 2017; Coughlan & Cronin, 2017).

5.5 Ethical Considerations

All literature used to form the analysis in the systematic literature review of this research are verified as proper, scientific articles from approved scientific journals and all research and knowledge acquired from any source that is used in this study will be properly cited and the researchers/developers responsible will be rightfully credited.

This study will meticulously follow the guidelines for “responsible conduct of research” provided by The Finnish Advisory Board on Research Integrity (TENK); the principles of integrity, meticulousness, and accuracy in conducting research, and in recording, presenting

and evaluating the results will be carefully applied; it is ensured that the method of data collection, research and evaluation conforms to scientific criteria and is ethically responsible, and devoid of any form of plagiarism; the results will be published in an open and responsible manner; as stated previously, all work and achievements of other researchers will be properly credited and respected; and all necessary permits will be requested and acquired before any research is done (The Finnish Advisory Board on Research Integrity, TENK, 2012).

The protection of public trust has been very carefully considering in this study, taking great care to avoid issues of research or scientific misconduct. There will be no falsification, fabrication, or plagiarism in any stage of this thesis (Polit & Beck, 2017, p.153). Search procedures and data are presented as openly and clearly as possible to allow the reader to judge its effectiveness.

6 Results

The thirteen articles selected were from different countries which was beneficial to the research question which aims to compare the knowledge and attitudes of nurses in different countries. Each of the studies were also conducted in different time periods which is again favourable in answering the research question which aims to examine the developments of nurses' knowledge and attitudes towards pain management over time (1995-2020). The articles reviewed were from the years 1996-2020.

As seen in the table in Appendix 7, three of the studies are from the United States from three different years (Boston 1996, North Carolina 1999, and Chicago 2011), one study is from Europe, Italy 2015, two studies are from South East Asia (Singapore 2005 and Philippines 2017), two are from East Asia (Hong Kong 2004 and 2008), and four studies are from the Middle East (Turkey 2013, Jordan 2014, Palestine 2017, Saudi Arabia 2018, and Iraq 2020). As such the articles reviewed in this literature review are diverse.

6.1 Nurses' Level of Knowledge and Attitudes Regarding Pain in Different Countries

All the studies chosen, as explained previously, use McCaffery and Ferrell's NKASRP survey tool to determine and quantify the level of knowledge and attitudes regarding pain the sample population of registered nurses in their chosen setting have. The results have been presented as mean average scores from survey. Since the methods and result formats coincide, it is possible to use these values to compare the level of knowledge and attitudes

nurses in different countries have using these scores. The mean NKASRP scores in different countries represented in each study has been summarized in Table 3 below.

Year	Region	Mean NKASRP Score in %
1996	Boston	62 %
1999	North Carolina	64,58 %
2003	Hong Kong	44 %
2005	Singapore	42,57 %
2008	Hong Kong	47,72 %
2011	Chicago	80,94 %
2012	Jordan	48,25 %
2013	Turkey	39,65 %
2015	Italy	54 %
2017	Philippines	47,14 %
2017	Palestine	45,60 %
2018	Saudi Arabia	46,25 %
2020	Iraq	48,10 %

Table 3: Percentage Mean Scores of NKASRP survey in each study

To get a clearly picture of this data, a bar chart such as the one in Fig. 3 can be used. As shown in Fig. 3, the highest NKASRP score and therefore the highest level of knowledge and the best attitudes regarding pain is found to be in Chicago (80,94%). 80% has been stated as the passing grade to show appropriate/acceptable levels of knowledge and attitude regarding pain by McCaffery and Ferrell, showing that nurses in Chicago have appropriate knowledge and attitudes regarding pain. This also means that Chicago is the only region identified among the studies reviewed in this thesis that achieved a passing average score.

The second and third highest scores are found in Boston (62%) and North Carolina (64,58%) which can be interpreted to show that the United States, out of all regions in the studies reviewed, has the highest average NKASRP scores and therefore the best knowledge and attitudes among nurses towards pain. The next region with highest average score is Italy with 54%. The lowest NKASRP mean score, however, is found to be in Turkey (39,65%) which is a very notably low average score.

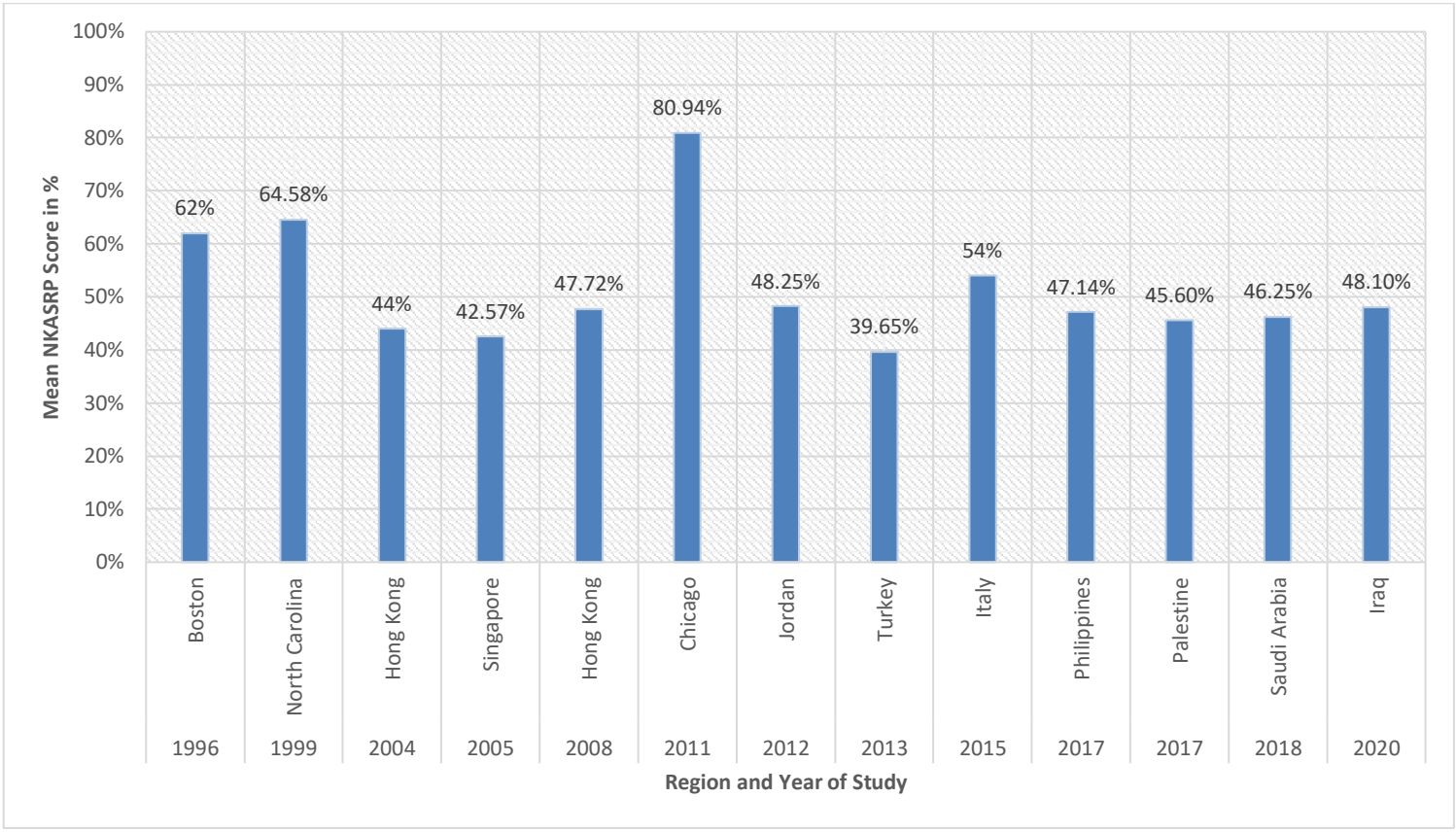

Fig. 3: Mean NKASRP Scores in Different Countries

6.2 Development in Nurses' Knowledge and Attitudes Towards Pain Over Time

As can be noted from Fig. 3 – where the x-axis, i.e. the countries in question, are arranged according to year of the study – there is no pattern to be found in the mean NKASRP scores and the years of all the studies put together. This is understandable since all these studies as explained earlier are from different parts of the world where cultural and even medical practices and beliefs, including the health care systems, are very different. For this reason, pain management knowledge and attitudes can be expected to be just as different (as was noted in this section) and also for these knowledge and attitudes to develop at a different rate. That is why comparing the NKASRP average scores based on year of study would not be appropriate. However, if we consider the different regions that were noted earlier and group the studies according to their common region (United States, South East Asia, East Asia/ Hong Kong, and the Middle East) then a development of knowledge and attitudes towards pain can be noticed. The Italy study, being the only one included from Europe and with no other study to compare it to, was left out of this part of the analysis.

Fig. 4 – 7 display bar charts of the mean NKASRP scores of the different studies grouped according to the regions they were set in. The dashed trendlines drawn in each bar chart

visually represents the development of nurses' knowledge and attitudes towards pain over time.

The trend line, in Fig. 4 below, shows a positive growth in knowledge and attitudes of the nurses in the United States based on the studies reviewed. The average NKASRP score increases from 62% in 1996 to 64,58% in 1999 (a 4,16% increase in 3 years) and then further increases to 80,94% in 2011 (a 25,33% increase in 12 years). Overall from 1996 to 2011 there has been a 30,55% increase in 15 years, which is significant considering 80% is the passing score.

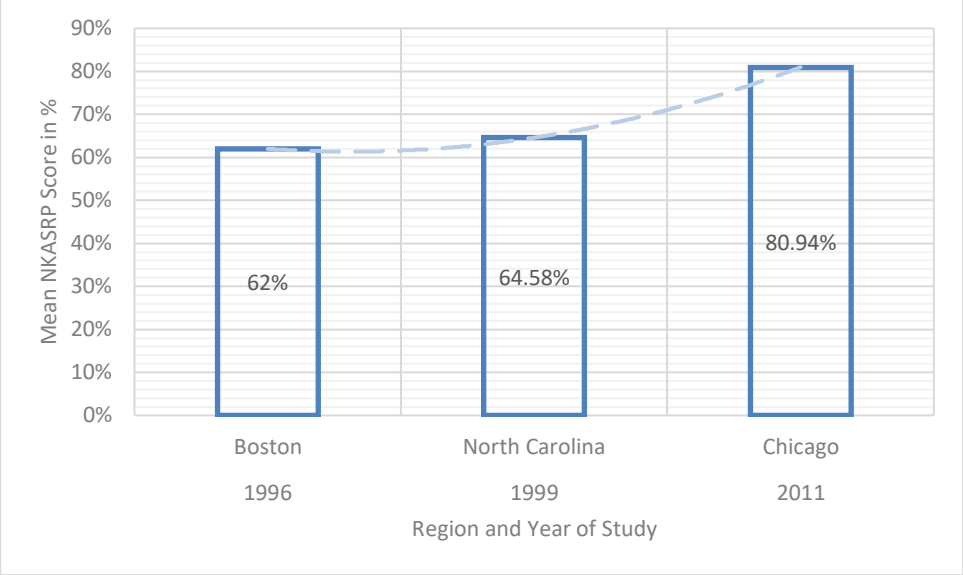

Fig. 4: Mean NKASRP Scores in United States between 1996-2011

The next region, East Asia, is perhaps the most appropriate comparison to show the development of NKASRP scores over time considering both studies are set in Hong Kong. As seen in Fig. 5 below, The growth is very minor but still shows an increase over time from 44% in 2004 to 47,72% in 2008 (a 8,45% increase). However, it is important to note that the studies are only four years apart in time in this case. Taking into account that in the United States region in Fig. 3 also showed a small growth of 4,16% between Boston and North Carolina in 3 years, a 8,45% increase in 4 years in Hong Kong is plausible and can be seen as a significantly positive development.

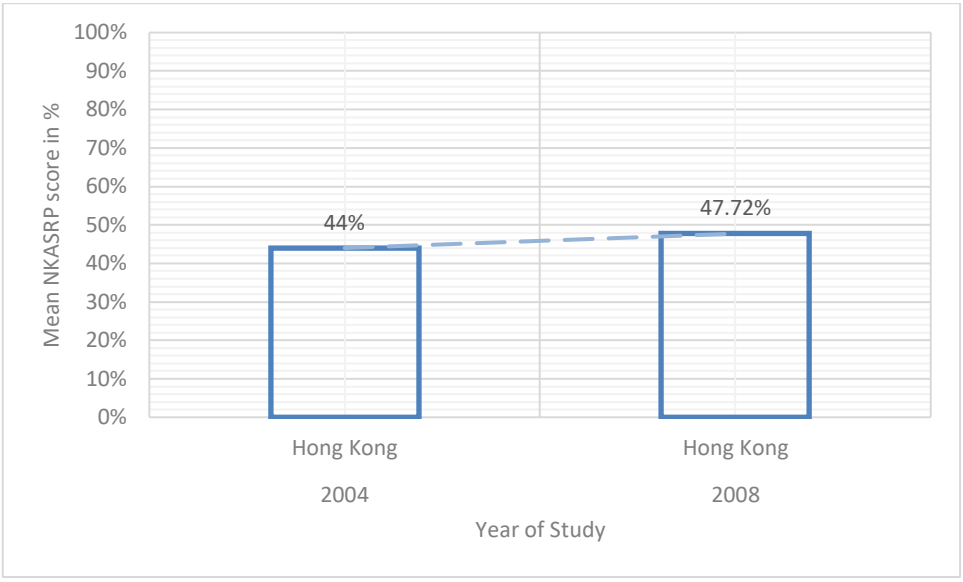

Fig. 5: Change in Mean NKASRP Scores in East Asia/Hong Kong from 2004 to 2008

In Fig. 6 below, we can see the change in the mean NKASRP scores in South East Asia between the years 2005 and 2017. The trendline displays again a positive growth from 42,57% to 47,14% (10,74% in 12 years). The growth/ development is very small in comparison to other regions e.g. United States which displayed a growth of 25,33% in the same number of years. Also in comparison to Hong Kong which displayed a growth of 8,45% in just 4 years.

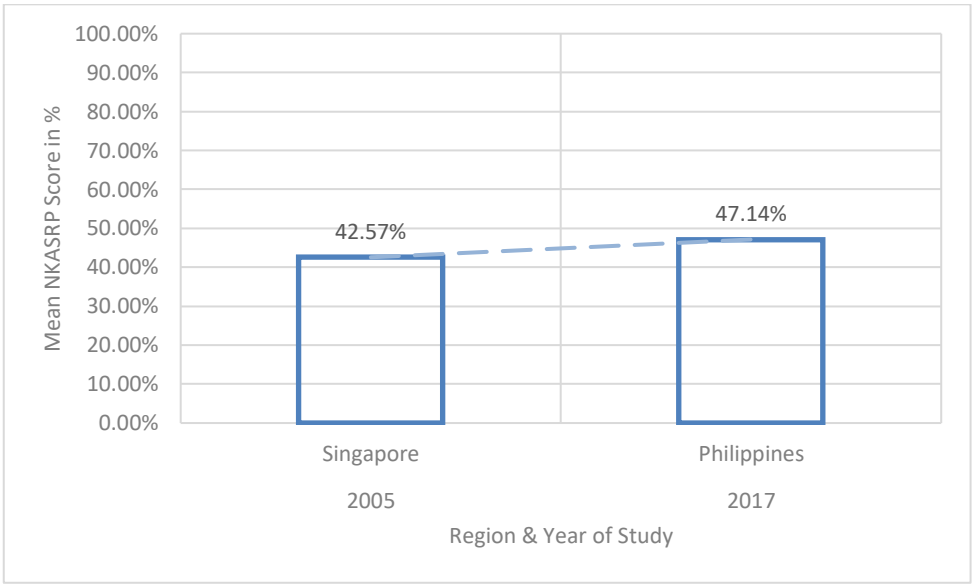

Fig. 6: Change in Mean NKASRP Scores in South East Asia from 2005 to 2017

Lastly, in the Middle East (seen in fig. 7 below), there is a positive growth between the years 2013 to 2020, however the year 2012 appears as an anomaly where the NKASRP

average score is higher than any of the other Middle Eastern regions in any other year among the studies reviewed.

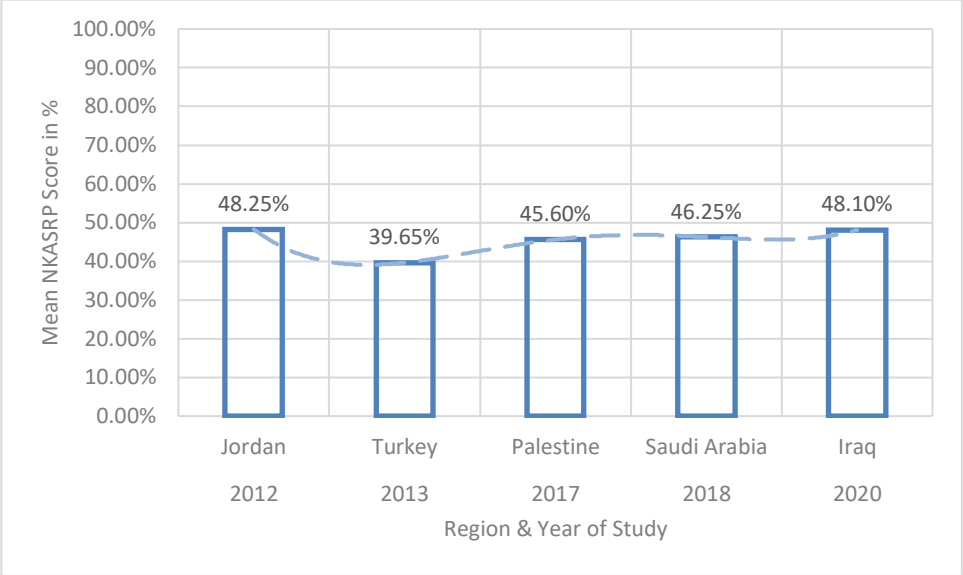

Fig. 7: Mean NKASRP Scores in the Middle East between 2012-2020

The reason for this anomaly is possibly that the study reviewed which is set in 2012 is from Jordan, a country in the Middle East that is known to have very advanced health care, and the best health care system in the Arab region. It is also noted to be a country that attracts a lot of medical tourism. As such, it would be no surprise to find that nurses in Jordan have better knowledge and attitudes towards pain management than other countries in the Middle East despite being in the same region.

However, leaving that aside, just as seen in all other regions in the studies reviewed, there is a positive growth in NKASRP scores between 2013 to 2020. First, there is a significant development of 15% between 2013 and 2017 (4 year period) which is significant in comparison to other regions' rate of growth. Next there is a 1,43% growth between 2017 and 2018 which is understandable considering it represents a period of only 1 year. Finally, there is an increase of 4% between 2018 and 2020 (2 year period). In total between 2013 and 2020 (7 year period) a positive growth of 21,31% is noted in nurses' knowledge and attitudes towards pain.

6.3 Most Prevalent Areas of Misconception and/or Misinformation Towards Pain Among Nurses in Studies Reviewed

In order to find which areas of pain and pain management nurses in the reviewed studies are found to be most lacking in terms of knowledge and attitudes, the results from the NKASRP survey can be used. All of the studies reviewed provided detailed information regarding participant responses to the questions in the surveys. All of the studies noted questions and sections that the nurses had most difficulty answering, including percentages of nurses that answered any given question incorrectly. By reviewing carefully the questions that were answered incorrectly the most in each study, the most prominent and prevalent misinformation and misconceptions (based on the studies reviewed) can be identified.

To do this in a systematic and organised manner, all questions noted in the studies to have been answered incorrectly by more than 49% of the participants were noted. A table was then made consisting of the following column headings – question, studies indicated, percentage answered incorrectly, and frequency. This table can be found in Appendix 8. The table allowed for a clear picture to be drawn on which questions were most frequently answered incorrectly overall in the studies examined. The frequency of which the questions were found to be answered incorrectly by more than 49% of participants was used to sort the questions in order from most frequent to least frequent. Most frequent representing the most prevalent and prominent misconceptions or misinformation, i.e. the most lacking areas of knowledge and attitudes that nurses in these studies have towards pain.

The questions that had a frequency of 5 and above, i.e. the questions that were answered incorrectly by more than 49% of participants in at least 5 or more of the studies reviewed, were put into a bar graph shown in Fig. 8. As seen in the figure, the question with the highest frequency of being incorrectly answered by more than 49% of participants in the studies reviewed is related to vital signs (pain assessment) and opioid administration in cancer pain (appearing in 9 studies reviewed). The next most frequently incorrect question is related to the risk of addiction, i.e. using opioids for pain relief in patients with substance abuse (appearing in 8 studies reviewed). As noted previously under “Myths & Misconceptions about Pain”, this is one very prevalent misconception. Fear of addiction among nurses in the use of opioids for pain relief has been noted very often to hinder proper pain management.

Notably 7 of the 14 (half) questions shown in Fig. 8 are relevant to pharmacological treatment of pain, involving drug administration routes, dosage, duration of action,

conversion between analgesics, etc. This shows that pharmacological treatment of pain/ drug administration is a major area that constitutes deficits in knowledge when it comes to nurses based on the studies reviewed. Two of the questions are relevant to respiratory depression and the use of opioid analgesics. One question is related to whether opioids should be used during pain evaluation period when the cause is unknown as it may interfere with diagnosis (appearing in 5 studies). This is again one of the common misconceptions noted previously in the "Myths & Misconceptions about Pain" section, since providing pain relief does not mask or hinder diagnoses because diagnoses are usually achieved via diagnostic tests that are irrelevant to pain. As such, patients should not be made to endure pain when it is possible to relieve it.

The question regarding using non-drug interventions, i.e. non-pharmacological treatment of pain also had a frequency of 5 (was shown to be one of the most incorrectly answered questions among the studies reviewed). This shows that there are knowledge deficits not only in pharmacological but also non-pharmacological treatment of pain among nurses in the studies reviewed.

In terms of attitudes as well, three of the questions in Fig. 8 display poor attitudes towards pain among the nurses in the relevant studies: the vital signs question which had the highest frequency of being answered incorrectly is significant since pain assessment should rely first and foremost on the patient's own description of their pain; similarly, the question regarding what percentage of patients overreport their pain was also noted to be answered incorrectly by a majority of participants in 6 of the studies reviewed, and this once again goes against the idea that the patient is the most accurate judge of their pain and therefore no patient overreports their pain; lastly, the question regarding whether patients can sleep despite having severe pain was answered incorrectly by majority of nurses in 7 of the studies reviewed, once again showing misconception towards pain.

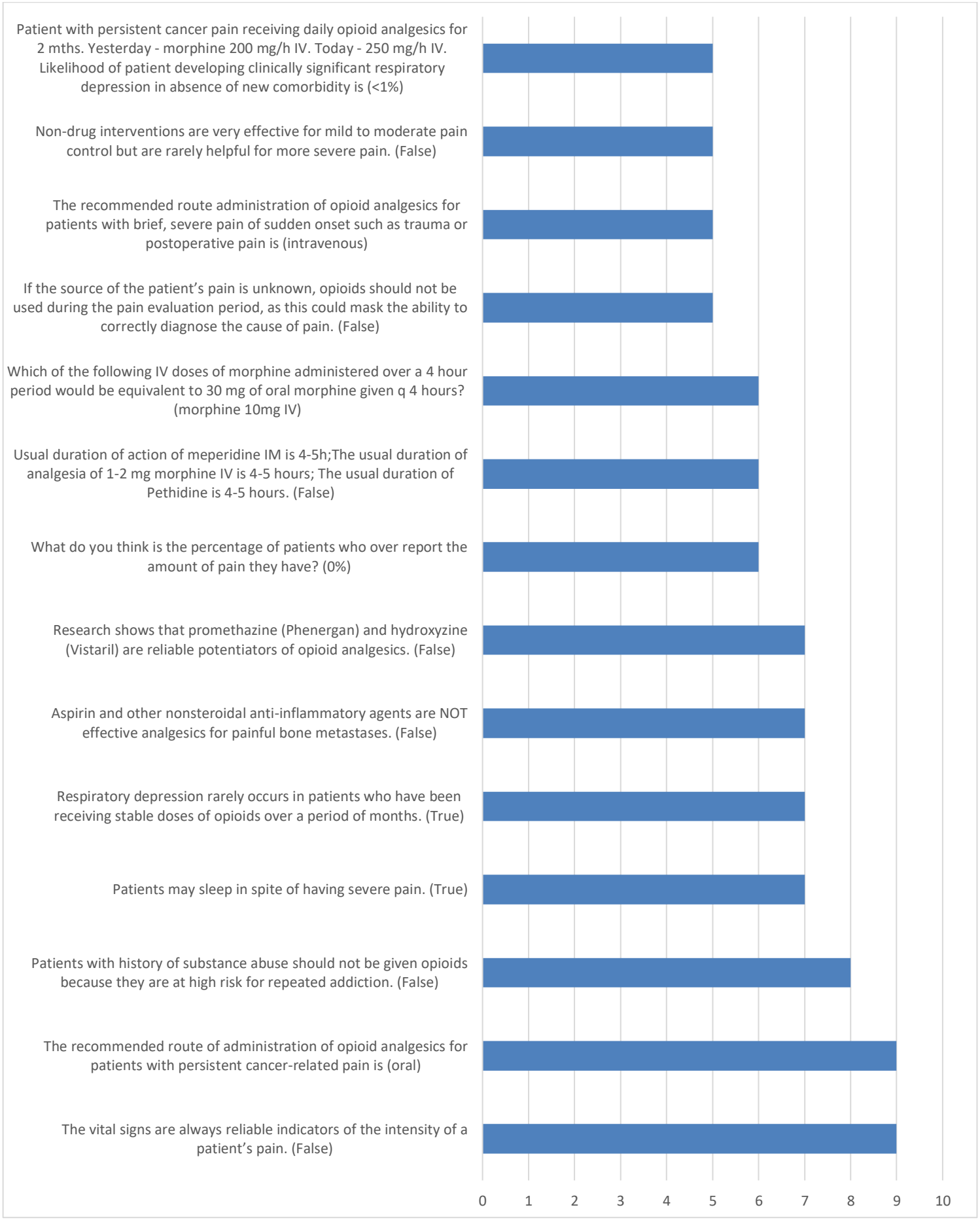

Fig. 8: Most Incorrectly Answered Questions in Studies Reviewed

Another piece of information that can be extracted from this is the improvement shown over time in the incorrectly answered questions. Despite being in the same region, comparing the questions most incorrectly answered in each over time would not yield reliable results since every country would still vary to a certain extent. However, two studies which are not only from the same region but also the same country can be compared in this manner, i.e. the studies conducted in Hong Kong in 2004 and 2008. The improvements in Hong Kong over these 4 years is noticeable not only in the mean NKASRP scores but also in the percentage of participants that answered the questions in Fig. 8 incorrectly. This can been seen in Fig. 9 below. An improvement can be seen in all these questions. The question related to the recommended route of opioid administration in cancer pain which was answered incorrectly by a majority in the 2004 study is answered correctly by the majority in the 2008 study showing improvement in knowledge of that specific question. The questions related to vital signs and overreporting of pain also show a lower percentage of participants answering them incorrectly despite still being in the majority side – this shows a gradual improvement in attitudes towards pain in Hong Kong.

However, two areas of negative development are found. The first is related to the misconception of addiction risk/ use of opioids in patients with history of substance abuse. While a majority of nurses answered this question correctly in the 2004 study, 61,5% of nurses answered it incorrectly in the 2008 study which could show an increase in the fear of addiction among nurses and therefore an increase in the prevalence of this misconception over the 4 year period of time. The second is related to the overreporting of pain by patients. In 2004, 86,3% nurses answered this question incorrectly, and this percentage increased to 98,6% in 2008 which is very significant since it shows that this poor attitude regarding patient's pain assessment was found in nearly all the nurses in Hong Kong in 2008.

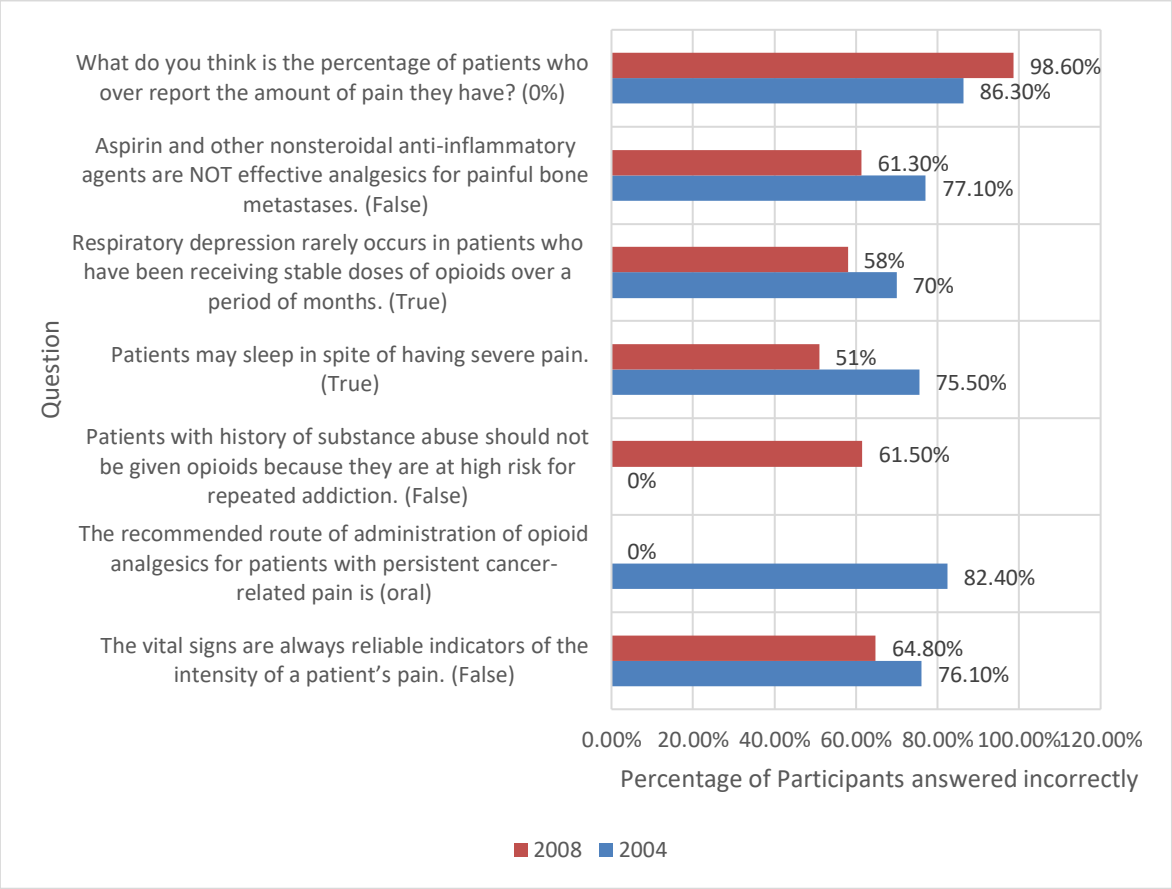

Fig. 9: Change in Percentage of Participants Answering the Frequently Incorrectly Answered Questions in Hong Kong between 2004 and 2008.

7 Discussion

The results and findings of this thesis, consistent with those in other relevant research, demonstrate that nurses in various parts of the world have limited and suboptimal knowledge as well as poor attitudes and misconceptions regarding pain, which supports the concern of inadequate knowledge and attitudes regarding pain management among nurses. All regions studied except the United States (Boston, North Carolina, and Chicago) and Italy had NKASRP scores below 50%, meaning more than half of the questions in the survey about different areas of pain management were answered incorrectly by majority of the nurses. Even the studies in the United States and Italy, except for the study conducted in Chicago did not achieve the passing score of 80% and thus revealed inadequate knowledge and attitudes towards pain among the nurses. In fact, despite achieving a passing score of 80,94%, data from the study in Chicago displays a lack of knowledge in pharmacological interventions which again reinforces concern of inadequate knowledge, and also reaffirms

results from existing research. (Bergh & Sjöström, 1999; Brunier et al., 1995; Clark et al., 1996; Lui, So, & Fong, 2008; Tanabe & Buschmann, 2000; Textor & Porock, 2006).

The reason for the United States region in particular showing higher NKASRP scores than other regions in the articles reviewed could owe to the United States' focus on research about pain management stemming from an increase in number of disabled veterans as early as the 1940s and 1960s. (Bernard et al., 2018) Ever since, pain and its management has been regarded as a major concern and research in this field has been promoted in the United States, leading to the creation of major pain organisations like the American Pain Society for example, as mentioned previously. In addition, ancestry studies by McCaffery and Ferrell regarding pain management in the nursing field also originate in the United States. These studies were noted as the basis for nearly all nursing studies related to pain management (cited in all articles reviewed, as well as relevant articles used in this thesis). The studies by McCaffery and Ferrell allowed for pain management to be further highlighted as a major issue, led to many major findings such as the definition of pain accepted today, the relationship of nurses' knowledge and attitudes with pain management practice, etc., including the invention of the NKASRP tool used to measure knowledge and attitudes regarding pain. As such, it is understandable that the United States should have higher NKASRP scores, despite the scores still being inadequate.

The results also reveal that there is positive but gradual development in nursing knowledge and attitudes towards pain management in different parts of the world. This shows that improvement is possible and is occurring at different rates in different parts of the world as a result of research and other pain management societies and policies fuelling this growth and change. Awareness of the inadequate knowledge and attitudes towards pain in United States once again could be why the growth and development in this region is most significant. In countries of the Middle East where the studies reviewed were some of the first of their kind and where this issue is only just becoming renowned and taken into account, slow and minimal but still significant positive growth is displayed. This reaffirms the scope of the problem and the importance of continuing research in this field to create awareness and also to design possible interventions, while also monitoring the development over time.

Regardless of any comparisons, however, it was made clear that every country, at the time of conducting the study, was lacking in knowledge and attitudes towards pain management. A major concern based on these outcomes is that the majority of nurses participating in many of these studies, as well as previous studies lacked proper awareness of their inadequate level

of knowledge and attitudes towards pain management within their working units. For example, the study by Brown et al., 1999 (North Carolina) reported that 70% of the participating nurses believed that they were very successful in their care for patients in pain, which contradicts the below passing average NKASRP score of 64,58%, showing their obvious inadequacy. (Brown et al., 1999) This means that there is a disparity between perceived and actual knowledge. This lack of awareness could be a reason why the average scores were suboptimal and why growth and development of these scores over time is only gradual. Nurses believing they already have adequate knowledge and attitudes, and/or who do not find any issues in their current practice, would not be too interested in for example seeking out pain management programs, special training, or further knowledge in pain management, which is important to ensure their knowledge, attitudes, awareness, and practice is improved and constantly updated.

Continuing from the previous point, education is obviously a major impacting factor in influencing nurses' knowledge and attitudes towards pain management. Most of the studies reviewed, and previous research conducted on the topic, a lot of studies report education as an influencing factor to nurses' NKASRP scores. Some studies display that nurses who have further education degrees (e.g. Masters or PhD) tend to have higher scores than those who do not. Many studies also show that nurses who have taken part in some kind of pain management training program/class, read an article about it, or simply consumed any form of educational material on the topic, had higher NKASRP scores than nurses who did not (Latina et al., 2015; Kekkeies et al., 2015; McNamara et al., 2012; Bernardi et al., 2007; Lai et al., 2003; Wang & Tsai, 2010; Yava et al., 2013; Patiraki et al., 2006). This means that another major reason for low NKASRP scores can be attributed to deficiencies in education and training.

In the Boston study by Clark et al, 1996, for example, the participant nurses rated the education they received regarding pain management as lacking in the five major areas of pain management that were investigated – anatomy & physiology, acute & chronic pain, pain assessment, pharmacological interventions, and nonpharmacological interventions. Education on pain management should be a continuous process and can be attained through preregistration education (bachelor/ diploma degree), continuing further education (Masters or PhD degree), hospital training, or via own interest (reading articles, attending seminars, workshops, etc.). Evidence in the study by Clarke et al, 1996, showed that nursing school education was where the participating nurses got the most information regarding pain management, and hospital orientation programs was where they got the least in all fields

investigated. This shows that there is insufficient or inadequate training regarding pain management in hospitals.

Also, taking into account that nurses got most of their information about pain and its management from nursing school and still underperformed in the survey getting NKASRP scores below the passing score goes to show that the education on pain management in the nursing curriculum, regardless of the country (since this was the case in all studies reviewed) is inadequate. The study conducted in Hong Kong by Lui, So, & Fong., 2008, indicated that upon reviewing 'A reference guide to the syllabus of subjects and requirements for the preparation of registered nurses (General) in Hong Kong Special Administrative Region 2004' (NCHK 2004), pain assessment and management were not specifically identified in the syllabus. Only 20 hours were allocated to only fundamental and basic concepts in pharmacology (Lui, So, & Fong, 2008). This goes to show that the focus on pain management is very limited and lacking in nursing training programs which can contribute to the reason for nurses having poor knowledge and attitudes towards pain. Education as a major barrier to adequate pain relief and as a cause for poor knowledge and attitudes towards pain among nurses has also been well documented in previous research (Bonica, 1980; Von Roenn et al., 1993; Ferrell, McGuire, & Donovan, 1993; Graffam, 1990; Ferrell, McCaffery, & Rhiner, 1992; Kopchak Sheehan et al., 1992) and was discussed as a major reason behind the findings in all studies reviewed.

Other than there being a lack of focus on pain management in the syllabi of nursing education programs, another source of inadequacy could be attributed to firstly the content regarding pain in the curricula, and secondly to inadequate knowledge and attitudes of the educators/ nursing faculty. A study conducted by Graffam in 1990 surveying the pain continent in the nursing curriculum showed that the content of the curriculum regarding pain was both insufficient (lack of emphasis on pain management) and contained some misinformation, both of which could lead to nursing students who later become registered nurses having inadequate knowledge and attitudes towards pain management. The results displayed that only 8% of the nursing programs surveyed reported having a separate course about pain, and time spent on pain ranged from less than 2 hours (6%) to more than 15 hours (4%), the mode being 4 hours (23%), and these were integrated into several courses. The most common topics in pain management most taught in the curricula surveyed were assessment (92%), nature of acute (81%) and chronic (87%) pain, and drug therapy (84%). Additionally, a lot of the respondents of the surveys reported that many of these topics were only mentioned in

passing. Majority of the programs (82%) also reported having no one in the faculty who specialized in pain management (Graffam, 1990).

The content of standard textbooks used in many nursing programs to educate nursing students has been found to be a *"major source of inadequate attention given to pain."* (Ferrell, McGuire, and Donovan, 1993). A study conducted by Ferrell, McCaffery and Rhiner in 1992 provided evidence that only 1.6% of textbook pages were devoted to content regarding pain, after examining 14 major textbooks used in nursing schools for medical-surgical or pharmacology courses (Ferrell, McCaffery, and Rhiner, 1992; Ferrell, McGuire, and Donovan, 1993). Similarly, a study conducted by Watt-Watson and Watson in 1989 that surveyed formal curricular pain content in 26 nursing schools and 14 medical schools, also reported similar findings. 48% of nursing schools reported no pain content or content less than 3.5 hours, while 17% had "integrated content that was no unidentifiable". 22% of the nursing school faculty expressed dissatisfaction towards the current pain content and revisions in their programs (Watt-Watson & Watson, 1989). The study by Ferrell, McGuire, and Donovan (1993) showed that in nursing schools investigated, very few taught beliefs and misconceptions, or current research regarding pain in the curricula. While all major areas of pain content were covered, the hours spent on them was very insufficient. Once again, the faculty members rated their curricula as only moderately effective in providing future nurses with adequate pain management education, thereby showing they believed the curricula was not completely satisfactory. The study also provided data showing that 20% of faculty participants in the survey had inadequate knowledge and attitudes towards pain, and had beliefs which were inconsistent with current knowledge and research, showing that possibly 1 in 10 nurse educators in the investigated nursing schools were teaching outdated or inappropriate material to nursing students (Ferrell, McGuire, and Donovan, 1993). All of these contribute majorly to why registered nurses in different countries are found to have incommensurate knowledge and attitudes towards pain.

The results in this thesis also allowed for the determination and ranking of the most prevalent content areas with misinformation, inadequate knowledge, and/or poor attitudes in pain management. This was important as it displays the content areas of nursing that need the most reinforcing in terms of education and training among nurses both before and after their formal education (bachelor degree/ diploma degree). These areas were found to be – pain assessment; pharmacological interventions; and non-pharmacological interventions.

The most detrimental finding common among all reviewed articles revealed a discrepancy in attitudes towards pain and practice. While majority of nurses in all studies from different countries answered correctly that the patient is the single most reliable and important judge and source when assessing pain, as shown in this study, a large majority of nurses in a majority of the studies reviewed still had the misconception that *"changes in vital signs must be relied on to verify a patient's statement of pain"*. Even more contradictory and cause for concern was that a majority of nurses in majority of the studies reviewed still incorrectly believed that patients overreported their intensity of pain. This shows that nurses relied more on patients' non-verbal behaviour, vital signs, and their own personal beliefs during pain assessment despite knowing that the patient's self-report is the single most reliable indicator of pain.

The results in this thesis also reinforced the existence of the major misconception in pain management regarding opioids and addiction. Fear of addiction has been reported as the most frequent barrier to effective pain management (Beck, 2000; David et al., 2003; Edrington et al., 2009; Finley et al., 2008). Fear of addiction as a result of using opioids for pain relief can result in undermedication of patients in pain, and this may result once again from inadequate education (Marks & Sachar, 1973; Bonica, 1980; Cohen, 1980; Hills & Fields, 1989). Ferrell, McCaffery, and Rhiner (1992) have provided evidence that nearly all of the nursing textbooks investigated contained confusing terminology and inaccurate information regarding opioid addiction, and erroneously promoted fear of addiction to opioids used for pain relief. Majority of textbooks also omitted vital and fundamental information on this topic that would be needed for the nursing student to develop proper understanding and attitudes towards opioid usage in pain relief (Ferrell, McCaffery, and Rhiner, 1992).

Other than education, another factor that could influence this misconception, as discussed in some of the studies reviewed, (Lui, So, & Fong, 2008; Yava et al., 2013; Qadire & Khalaileh, 2014) is opioid legislation in different countries. The policies and procedures for prescribing and dispensing, as well as the storage process of opioid analgesics could very well hinder their provision to patients in pain as well as fuel any bias in nurses against their usage. As noted in the Jordan study (Qadire & Khalaileh, 2014), the Hong Kong study (Lui, So, & Fong, 2008), the Turkey study (Yava et al., 2013), and even in the Italy study (Latina et al., 2015), although the World Health Organisation has classified opioids as a valuable resource in pain management, opioids in these countries are considered and classified as "dangerous" and are not within the ward. Detailed documentation and lengthy chain of command is

required to administer these drugs which could both discourage their use as well as give the false impression that they are harmful even to patients in pain.

This indicates a barrier towards pain management and adequate pain relief to the patients, as nurses may provide less pain medication than required or assess pain less frequently, etc. Some studies reviewed for example the ones conducted in Hong Kong (Lui, So, & Fong, 2008; Tse & Chan, 2004) and the one conducted in Jordan (Qadire & Khalaileh, 2014) indicate culture as a possible explanation for these discrepancies in knowledge, attitudes and practices of nurses. In fact, in the Jordan study (Qadire & Khalaileh, 2014), it was stated that fear of addiction with opioid usage was a cultural fear that dominated the majority of the community including health care workers, leading to both abstinence from the patient as well as avoidance of prescribing opioids among the health care workers which is problematic. News of patients taking opioids would spread rumours, especially due to the interconnected community life in Jordanian culture, and due to lack of awareness and proper education, the community would ostracise these patients confusing usage of opioids for medical use and abuse of them on the streets. In addition to this widespread misinformation, Islamic religion which has the principle stating that people should "submit to the will of God" once again encourages endurance of pain rather than pain relief. In Chinese culture, it is believed for example that western medication may interrupt the yin and yang balance which may once again hinder proper pain relief (Wills & Wootton, 1999). All of these cultural factors contribute to why misinformation about opioid analgesics are still prevalent in countries like Jordan, Hong Kong, and Turkey, and may well be so in countries with similar cultural and/or religious values.

Furthermore, as mentioned also in the "Results" section, questions concerning pharmacological interventions were where majority of participants in majority of the studies had difficulties. Things such as dosage, effective duration, rotation between drugs, side effects, preferred route of administration, and as previously mentioned, fear of addiction. This was concerning since despite studies showing that most nursing programs taught mainly drug therapy and pharmacological fundamentals when it came to pain management, this was still the main area discovered to have knowledge deficits and misinformation in this thesis. This once again solidifies that the information present in nursing textbooks and that is taught in nursing curricula are inappropriate or deficient.

Most participants in majority of studies reviewed did not know that oral was the preferred route of administering opioid analgesics to patients with prolonged cancer pain, since it is

the most convenient and cost-effective method (Melzack, 1990). Most nurses in majority of the studies reviewed were also unable to recognize the effectiveness of aspirin and nonsteroidal anti-inflammatory drugs (NSAIDs) and that it can be used to treat bone pain and metastases. In fact, the American Pain Society (1992) reported that 50% of cancer pain may be controlled with NSAIDs alone (American Pain Society, 1992). Majority of nurses in the studies reviewed were also unaware that Promethazine (Phenegran) is not a potentiator of opioid analgesics, instead it increases the perceived intensity of pain (McGee & Alexander, 1979), as well as respiratory depression, sedative, and hypotensive effects of narcotics (McCaffery, 1995).

Finally, a majority of participants in the studies reviewed also reportedly had misconceptions regarding opioids and respiratory depression, significantly so since two questions on the survey related to respiratory depression were found to be among the most frequently incorrectly answered in the results of this thesis. Respiratory depression occurs in less than 1% of patients undergoing opioid therapy. Majority of nurses in the studies reviewed had the misconception that respiratory depression would occur in patients receiving opioids over a period of months.

What was also concerning was that in addition to pharmacological interventions, a question revolving around nonpharmacological interventions was also identified as most frequently incorrectly answered in the studies reviewed. This means that in addition to pharmacological interventions, majority of nurses in the studies reviewed also had misconceptions regarding nonpharmacological interventions; the misconception being that non-drug interventions are not effective against severe pain. Nonpharmacological interventions including heat, cold, imagery, etc. are effective against pain of all types and intensities and are strongly recommended to be used alongside and simultaneously with pharmacological interventions for effective pain relief (Acute Pain Management Guideline Panel, 1992; McCaffery & Beebe, 1989).

As such, we can determine that the major content area of pain management that has the most misinformation and misconceptions among the nurses studied in the articles reviewed is pharmacological interventions, particularly knowledge and attitudes related to opioid analgesics and their usage. Following this would be nonpharmacological interventions, and pain assessment. Therefore, it can be inferred these are the content areas that needs the most reinforcing in order to improve nurses' knowledge and attitudes towards pain management.

Other significant sources of poor knowledge and attitudes among nurses, which can be very directly linked back to the theoretical framework chosen in this study can also be discussed. One of these would be that in some countries where populations are high and dense, and health care does not have enough resources or support from the socioeconomic and political situation of the country, understaffing, along with patient overcrowding may occur. This means that bed occupancy rates would be high, the nurse to patient ratio vastly uneven, and very frequent patient transfers with very short stays in any given ward or unit. What this does for nursing care is that nurses spend very little and nearly inadequate time with any given patient in order to cater to the vast total number of patients in their unit; and due to the frequent transfers and this short period of care, nurses may put their focus and attention mainly on the haemodynamic status, disease progression, and curative treatment, rather than symptom control and management, and the patient's **comfort**. This was noted in the study conducted in Hong Kong by Lui, So, and Fong (2008) and is arguably the case in many developing countries and even some developed countries where the health care resources are focused on curative treatment (Lui, So, & Fong, 2008).

The second notable cause brings us back once again to the first point regarding awareness of nurses. While nurses were noted in this study, as found in many previous studies, to lack enough awareness of their inadequate knowledge and attitudes towards pain, it could also be argued that nurses lack enough awareness of their own major role in pain management, leading to these inadequate knowledge and attitudes. Due to physicians possessing the deciding role of prescribing pain medication and planning the pain management process, it is possible that nurses believe physicians bear the greatest responsibility which is untrue. As noted at the start of this thesis, nurses who spend the most time with the patient play a very important, and major role in the pain assessment and treatment process. It is important especially that nurses understand the value of their roles in pain management since pain is a **comfort** factor for the patient (under physical comfort in Kolcaba's theory) and therefore is a nursing problem which a nurse must consider and plan comfort interventions for. According to the **caring** theory, a nurse is the one capable of forming that understanding, **caring** relationship based on trust with the patient, and thus can act as an important bridge of communication between the patient and physician. As such, a nurse right from the start of their education, and throughout their training and work period must be encouraged to know the importance of their role in pain management, and empowered to act on it.

7.1 Limitations of this Thesis

Studies like the one conducted in this thesis in order to collect existing information and present a more broad picture and understanding of the situation should also be conducted more often and on a much larger scale. This study had many limitations being a bachelor thesis which can be greatly improved if done on a larger scale by more established or funded researchers. The most major limitation being that this literature review was conducted by only one person. Literature reviews, especially systematic literature reviews, should be conducted by at least two researchers in order to ensure as much reliability as possible and to prevent any bias (Polit & Beck, 2017; Holly, Salmond, & Saimbert, 2017). While this literature review was conducted with great care, meticulously to prevent any issues in reliability or bias, it remains true that having two or more researchers involved would have greatly improved its reliability. Another limitation is perhaps the number of articles reviewed. Even though all databases used were searched thoroughly based on inclusion and exclusion criteria, arguably more databases could be used to get even more articles, and grey literature could be more thoroughly checked. Two theories which have significant empirical evidence and have been proven as reliable and useful in evidence-based practice were used as the theoretical framework to form a strong scientific foundation for this study. Triangulation was attempted in order to provide credibility, by using more than one source for any major pieces of information inferred on conclusions drawn. The generalizability of this study was ensured by using a very systematic and detailed process which was explained in this thesis without holding back any information. The results and methods are therefore transferable and can be used or applied to other settings.

8 Conclusion

The findings of this study display that there are poor knowledge and attitudes towards pain among nurses in different countries, and while some countries show better results than others, the level of knowledge and attitudes remain inadequate. The countries reviewed in this study showed gradual improvement of knowledge and attitudes over time, the United States region especially showing successful improvement. This reinstates the purpose of this study showing that improvements can be made if positive change in the lacking areas noted are improved.

The lacking areas, as discussed proved to be majorly in the educational department of nursing, with pharmacological interventions, pain assessment, and non-pharmacological

interventions (in order of most lacking) were especially inadequately taught or presented the most misinformation among nurses. It is first of all important for nursing educators and faculty members to understand that there may be inadequacies and problems in their own knowledge and attitudes towards pain as well as in their nursing curriculum. Educators should be encouraged to read new research, part-take in workshops, attend lectures, etc. regarding pain management, and in general, pursue a continuous education approach to constantly update their knowledge which they share to nursing students. The pain curriculum as well as the textbooks and other material used for teaching and instruction to nursing students should constantly be analysed and evaluated to ensure they match the current guidelines and information regarding pain. Any problems identified should be dealt with the curriculum committee and pain experts to implement changes. While textbooks follow intervals of 1-2 years where they are updated and may take a while before the updated version make it into the hands of teachers and students for use, incorporating constantly updated and recognised sources such as The American Pain Society or World Health Organisation's publications as references into teaching and learning would be a good idea. Lastly, encouraging students, as well as graduated working nurses, to part take in workshops, lectures and even become members of pain societies is a good way to encourage them to absorb new knowledge about pain and also to increase their awareness of the problem that is inadequate pain management and their role as nurses in regards to this problem (Ferrell, McGuire, & Donovan, 1993; Graffam, 1990; Ferrell, McCaffery, & Rhiner, 1992). Previous studies conducted confirm that introducing educational programs about pain leads to improvement in nurses' knowledge and attitudes towards pain (Abdalrahim et al., 2011; Qadire, 2014; Lui, So, & Fong, 2008). Therefore, improving education should be a priority.

Another good idea could be to introduce McCaffery and Ferrell's NKASRP survey as a tool to gauge both graduating nursing students' and registered nurses' knowledge and attitudes towards pain. The survey can be conducted at regular intervals of a nurses' career and can have the same passing requirement of 80%.

The cultural factors which were also noted to affect knowledge and attitudes towards pain among nurses and even patients could once again also be attributed to education. With globalisation and the interconnections between countries that transcends geographical and cultural boundaries, cultural competence becomes a very vital skill that nurses of today need to be trained for. Transcultural nursing and international nursing courses need to become more prominent in nursing curricula, and more practicing nurses need to be made aware of cultural barriers and cultural differences in order to provide the best care they can to their

patients regardless of the patient's age, gender, race or socioeconomic situation which is the goal and mission.

Furthermore, using evidence-based and pro-holistic approach theories such as Kolcaba's comfort theory and Watson's caring theory, nurses can understand the importance of building a trusting relationship with the patient, as well as the importance of managing the patient's comfort, which includes pain. These two theories could also provide nurses with a mental image of how to approach patients in pain. Kolcaba's theory would emphasize the outcomes that should be sought, and Watson's theory would emphasize the nurses' role. As stated by Kolcaba herself on the website created for her theory, comfort is about the patient outcomes and caring is about the nurse's role (Comfortline, 2020). Using both of these together as a framework when dealing with patients in pain is therefore an ideal approach.

Additionally, action needs to be taken not just among nurses, students, and the educational sector, but the overall health care sector, economic sector and political sector of every country. Enough resources need to be allocated to health care to ensure improvements in nurses' workload, working conditions, as well as to prevent patient overcrowding, and finally to improve overall quality of care. These general improvements are without a doubt bound to affect pain management positively as well.

Lastly, further and continuous research in this field is of great importance. Information and articles on nurses' knowledge and attitudes towards pain of many countries could not be found, albeit they may have been in another language or unavailable in the databases used. More accessible and new research needs to be conducted in every country in order to properly gauge the level of nurses' knowledge and attitudes towards pain, find the lacking areas the need improvement and to monitor this progress and improvement over time. This study confirms that conducting research in this topic is valuable and should be done not just in every country but also over regular intervals of time so that the information stays updated and the progress and situation in every country is constantly monitored.

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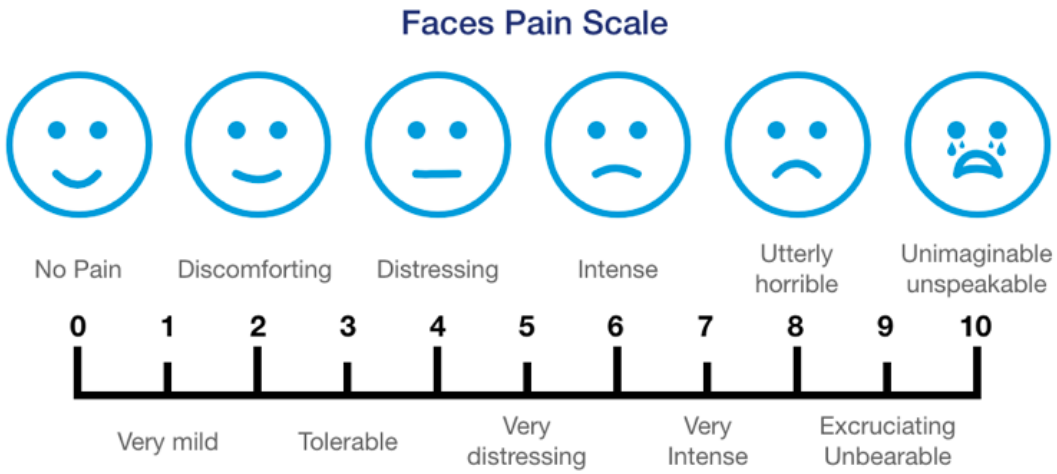
Appendices

Appendix 1: OPQRSTUV Mnemonic for Pain Assessment

Assessing pain using OPQRSTUV	
Onset	When did it begin? How long does it last? How often does it occur?
Provoking or palliating factors	What brings it on? What makes it better? What makes it worse?
Quality	What does it feel like? Can you describe it?
Region and radiation	Where is it? Does it spread anywhere?
Severity	What is the intensity of the pain? Right now? At best? At worst? On average?
Timing and treatment	Is the pain constant? Does it come and go? Is it worse at a particular time? What medications and treatments are you currently using? How effective are these? Do you have any side effects from the medications and treatments?
Understanding and impact on you	What do you believe is causing the pain? Are there any other symptoms with this pain? How is this pain impacting you and your family?
Values	What is your goal for this pain? What is your comfort goal or acceptable level for this pain (based on the pain scale)? Are there any other views or feelings on this pain that are important to you and your family? Is there anything else you would like to say about your pain that has not been discussed?

(Schipper, T. 2019)

Appendix 2: Faces Pain Scale



(Penrose, S., 2019)

Appendix 3: Kolcaba's Comfort Theory Grid

	RELIEF	EASE	TRANSCENDENCE
PHYSICAL	Pain Insomnia	PCA Positioning for comfort	Patient being able to sleep, reporting comfort despite pain.
PSYCHOSPIRITUAL	Depression Anxiety	Visit from family	Patient reporting feeling of calm and ease upon seeing family
ENVIRONMENTAL	Noisy unit, bright lights, uncomfortable pillow	Dimmed lights, closed room door, down pillow from home	Patient able to sleep, better comfort with home pillow
SOCIOCULTURAL	Lack of home routines	Bedtime story read by children	Patient feeling more at home with family present

(Kolcaba New Nurse Education, 2020)

Appendix 4: EBSCOhost (CINAHL and MEDLINE) Search History

EBSCOhost

Saturday, September 26, 2020 11:15:03 AM

#	Query	Limiters/Expanders	Last Run Via	Results
S4	S1 OR S2 OR S3	Limiters - Full Text; Published Date: 19900101-20201231; English Language; Peer Reviewed; Language: English Expanders - Apply related words; Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL with Full Text;MEDLINE	135
S3	(Nurses' knowledge and attitudes) AND pain management	Limiters - Full Text; English Language; Peer Reviewed; Language: English Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL with Full Text;MEDLINE	112
S2	(Nurses' knowledge and attitudes) AND Pain	Limiters - Full Text; Published Date: 19900101-20201231; English Language; Peer Reviewed; Language: English Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL with Full Text;MEDLINE	132
S1	(MH "Pain Management") AND (MH "Nursing Knowledge") AND (MH "Nurse Attitudes")	Limiters - Full Text; Published Date: 19900101-20201231; English Language; Peer Reviewed; Language: English Expanders - Apply equivalent subjects Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL with Full Text;MEDLINE	11

Appendix 5: PubMed Search History

Search number	Query	Sort By	Filters	Search Details	Results	Time
4	(("Pain Management"[Mesh]) AND ("Nursing"[Mesh] OR "nursing" [Subheading])) AND "Health Knowledge, Attitudes, Practice"[Mesh]	Most Recent	Full text, English, from 1990 - 2020	"Pain Management"[MeSH Terms] AND ("Nursing"[MeSH Terms] OR "Nursing"[MeSH Subheading]) AND "health knowledge, attitudes, practice"[MeSH Terms]	133	07:51:54
3	(("Pain Management"[Mesh]) AND ("Nursing"[Mesh] OR "nursing" [Subheading])) AND "Health Knowledge, Attitudes, Practice"[Mesh]	Most Recent	Full text, from 1990 - 2020	"Pain Management"[MeSH Terms] AND ("Nursing"[MeSH Terms] OR "Nursing"[MeSH Subheading]) AND "health knowledge, attitudes, practice"[MeSH Terms]	133	07:50:47
2	(("Pain Management"[Mesh]) AND ("Nursing"[Mesh] OR "nursing" [Subheading])) AND "Health Knowledge, Attitudes, Practice"[Mesh]	Most Recent	Full text	"Pain Management"[MeSH Terms] AND ("Nursing"[MeSH Terms] OR "Nursing"[MeSH Subheading]) AND "health knowledge, attitudes, practice"[MeSH Terms]	133	07:50:25
1	(("Pain Management"[Mesh]) AND ("Nursing"[Mesh] OR "nursing" [Subheading])) AND "Health Knowledge, Attitudes, Practice"[Mesh]	Most Recent		"Pain Management"[MeSH Terms] AND ("Nursing"[MeSH Terms] OR "Nursing"[MeSH Subheading]) AND "health knowledge, attitudes, practice"[MeSH Terms]	147	07:50:08

Appendix 6: Data Collection Table of Studies Included in Systematic Literature Review

	Title, Author, Publication, Year, etc.	Aim/Purpose	Method	Results
1	Pain Management Knowledge, Attitudes and Clinical Practice: The Impact of Nurses' Characteristics and Education by Clark et al., Journal of Pain and Symptom Management, 1996	To examine the knowledge and attitudes, and clinical practices of nurses towards pain management	Quantitative study. Sample of 228 nurses from nine clinical units in an urban hospital, were distributed surveys containing a demographic tool, Ferrell's NKASRP tool, and a Pain Audit Tool (PAT).	The mean NKASRP score (62%) showed knowledge and attitude deficits. Patients not reporting their pain freely/openly and being reluctant towards taking opioids for pain relief were the two main barriers to pain management according to the nurses. According to the demographic data, anatomy and physiology of pain, non-drug interventions, and the difference between acute and chronic pain were the most poorly taught in education. The Pain Audit Tool showed that 76% of patient charts had no record of a patient self-rating pain assessment tool.
2	Assessment of Nurses' Attitudes and Knowledge Regarding Pain Management by Brown, Bowman, and Eason, Journal of Continuing Education in Nursing, 1999	To determine the current knowledge and attitudes towards pain of nurses in North Carolina and	Quantitative study. Stratified random sample of 1000 nurses were surveyed using Ferrell's NKASRP tool, and a demographic tool.	The average NKASRP score was 64.58, showing deficits in knowledge and attitudes. No statistically significant relationship was found between education, practice setting, or clinical speciality and knowledge and attitudes towards pain.

		if education, practice setting, or clinical speciality affect this.		
3	Knowledge and Attitudes in Pain Management by Tse and Chan, Journal of Pain and Palliative Care Pharmacotherapy, 2004	To determine the current knowledge and attitudes towards pain of nurses in Hong Kong.	Quantitative study. 1604 registered nurses from three different hospitals in Hong Kong were surveyed using a Chinese translated version of Ferrell's NKASRP tool and a demographic tool.	Average NKASRP score was 11.7, showing deficit in knowledge and attitudes towards pain. There was a statistically significant positive relationship between education and nurses' knowledge and attitudes towards pain management.
4	Nurses' Knowledge on Pain Management by Naser, Sinwan, and Bee, Singapore Nursing Journal, 2005	To determine the knowledge and attitudes towards pain of nurses practicing at a restructured hospital in Singapore.	Quantitative study. 237 nurses from the restructured hospital were surveyed using Ferrell's NKASRP tool and a demographic tool.	The average NKASRP score was 14.9 (poor knowledge and attitudes), and inpatient and intensive care unit nurses scored significantly higher. There was no statistically significant relationship between the scores and the length of nursing experience.
5	Knowledge and Attitudes Regarding Pain Management among Nurses in	To investigate the knowledge and	Quantitative study.143 nurses were surveyed	Average NKASRP score was 47.72, showing deficits in knowledge and attitudes towards pain.

	Hong Kong Medical Units by Lui, So, and Fong, Journal of Clinical Nursing, 2008	attitudes towards pain management among nurses practicing at Hong Kong medical units, and the factors that may influence this.	using the Chinese translated version of Ferrell's NKASRP tool and a demographic tool.	
6	Nurses' Knowledge and Attitudes Regarding Pain Assessment and Intervention by Al-Shaer, Hill, and Anderson, MEDSURG Nursing, 2011	To determine nurses' knowledge and attitudes towards pain management.	Quantitative Study. Convenience sample of 129 nurses from Chicago were surveyed using Ferrell's NKASRP tool and a demographic tool.	Average NKASRP score was 25.9 (passing score, i.e. acceptable knowledge and attitudes towards pain). No statistically significant relationship between scores and shift worked, work status, age, or length of nursing experience.
7	Knowledge and Attitudes of Nurses about Pain Management in Turkey by Yava et al., International Journal of Caring Sciences, 2013	To determine the knowledge and attitudes of nurses towards pain management in turkey and their relationship to	Quantitative study. Descriptive and cross-sectional. 246 nurses were surveyed using Ferrell's NKASRP tool and a demographic tool.	Average NKASRP score was 39.65% which showed poor knowledge and attitudes towards pain. Statistically significant positive relationship found between scores and education, working unit, whether a pain course had been taken/ book or journal about pain read, and the evaluation of nurse's efficacy regarding pain.

		demographic and educational factors.		
8	Jordanian Nurses Knowledge and Attitude Regarding Pain Management, by Qadire and Khalaileh, American Society for Pain Management Nursing, 2014	To investigate nurses' knowledge and attitudes towards pain management in Jordan.	Quantitative study. 211 nurses were surveyed using Ferrell's NKASRP tool and a demographic tool.	Average NKASRP score was 19.3, showing poor knowledge and attitudes towards pain. No statistically significant correlation found between score and gender and education level. Nurses with previous pain education, however, got higher scores.
9	Attitude and Knowledge of Pain Management among Italian Nurses in Hospital Settings by Latina et al., American Society for Pain Management Nursing, 2015	To examine the knowledge and attitudes and type of approach of nurses towards pain management in Italy.	Quantitative study. 286 nurses were surveyed using Ferrell's NKASRP tool and a demographic tool.	Average NKASRP score was 54% showing limited knowledge and attitudes towards pain management.
10	Palestinian Nurses' Knowledge and Attitudes Regarding Pain Management by Nimer and Ghrayeb, International Journal of Scientific and Research Publications, 2017	To assess the knowledge and attitudes of nurses towards pain management in Palestine.	Quantitative study. Cross-sctional. Proportionate sample of 380 nurses were asked to undergo survey using Ferrell's NKASRP	Average NKASRP score was 15.5 showing poor knowledge and attitudes towards pain. No statistically significant relation between scores and gender, age, education level, or previous training courses or workshops on pain management.

			tool translated into Arabic, and a demographic tool.	
11	Knowledge, Attitudes, and Practices of Nurses on Pain Assessment and Management in Manila, Philippines by Adalin et al., 2017	To describe the level of knowledge and attitudes of nurses towards pain in Manila, Philippines.	Quantitative study. 235 nurses were surveyed using Ferrell's NKASRP tool and a demographic tool.	Average NKASRP score was 47.14% showing inadequate knowledge and attitudes towards pain.
12	Knowledge and Attitudes of Nurses Toward Pain Management by Samarkandi, Saudi Journal of Anaesthesia, 2018	To explore nurses' knowledge and attitudes towards pain management in Saudi Arabia.	Quantitative study. Cross-sectional. 247 nurses surveyed using Ferrell's NKASRP tool and a demographic tool.	Average NKASRP score was 18.5 showing poor knowledge and attitudes towards pain management. Statistically significant difference found between male and female participants' scores (females scored higher than males). No statistically significant relationship between score and exposure to previous education.
13	Evaluation of Nurses' Knowledge and Attitudes toward Pain Management at Baghdad Teaching Hospitals by Majeed, Hassan, and Abid, Indian Journal of Forensic Medicine and Toxicology, 2020	To assess knowledge and attitudes towards pain management of nurses in Baghdad.	Quantitative study. Descriptive and cross-sectional. 100 nurses were surveyed using Arabic version of Ferrell's NKASRP tool and a demographic tool.	Average NKASRP score was 48.1% which shows poor knowledge and attitudes towards pain.

Appendix 7: Table of demographic data of studies reviewed (year, country, and sample)

Year	Region	Sample
1996	Boston	120 registered nurses in nine nursing units of a large university-affiliated teaching hospital in an urban area of the Northeast
1999	North Carolina	260 out of 1000 registered nurses practicing in North Carolina
2004	Hong Kong	678 registered nurses practicing in three different hospitals in Hong Kong
2005	Singapore	198 registered nurses working in a restructured hospital in Singapore
2008	Hong Kong	143 registered nurses practicing at medical units in a public hospital in Hong Kong
2011	Chicago	129 registered nurses working in 10 different nursing units in a midwestern metropolitan hospital in Chicago
2013	Turkey	246 registered nurses working in a training and research hospital in Turkey
2014	Jordan	211 registered nurses practicing in 4 hospitals representing the health care sector in Jordan: 1 in northern part of the country (King Abdullah University Hospital), and 3 others in the Aman, the capital city (Prince Hamzah Hospital, King Hussein Cancer Center, and the Islamic Hospital)
2015	Italy	286 registered nurses working in one of the biggest specialized hospitals in Rome, Italy
2017	Philippines	225 registered nurses practicing in Medical Surgical units, and ICUs in 4 different tertiary hospitals in Manila
2017	Palestine	360 registered nurses from six different government and private hospitals that represent the health care sector in south of West-Bank Palestine
2018	Saudi Arabia	300 registered nurses practicing in three different hospitals that represent the health care sector in Saudi Arabia from northern, central and southern regions of Riyad
2020	Iraq	100 registered nurses practicing in four different teaching hospitals in Baghdad

Appendix 8: Table Showing All the Most Frequently Incorrectly Answered Questions in the studies reviewed.

Question	Study indicated	Percentage of participants that answered incorrectly	Frequency
Vital signs are always reliable indicators of the intensity of a patient's pain. (False)	Hong Kong 2004; Singapore 2005; Hong Kong 2008; Turkey 2013; Jordan 2014; Italy 2015; Palestine 2017; Saudi Arabia 2018; Iraq 2020	76.1%; 82.2%; 64.8%; 71.5%; 49.8%; 76.9%; 81.1%; 84.6%; 92%	9
The recommended route of administration of opioid analgesics for patients with persistent cancer-related pain is (oral)	Boston 1996; North Carolina 1999; Hong Kong 2004; Singapore 2005; Jordan 2014; Italy 2015; Philippines 2017; Saudi Arabia 2018; Iraq 2020	56%; 69.6%; 82.4%; 64.5%; 84.8%; 75.2%; 85.54%; 85.8%; 78%	9
Patients with history of substance abuse should not be given opioids because they are at high risk for repeated addiction. (False)	Boston 1996; North Carolina 1999; Singapore 2005; Hong Kong 2008;Turkey 2013; Jordan 2014; Italy 2015; Palestine 2017	53%; 79.3%; 68%; 61.5%; 55.3%; 55.5%; 56.3%; 74.4%	8
Patients may sleep in spite of severe pain. (True)	Hong Kong 2004; Singapore 2005; Hong Kong 2008; Turkey 2013; Italy 2015; Saudi Arabia 2018; Iraq 2020	75.5%; 79.7%; 51%; 72%; 67.8%; 79.8%; 82%	7

Respiratory depression rarely occurs in patients who have been receiving stable doses of opioids over a period of months. (True)	Boston 1996; Hong Kong 2004; Singapore 2005; Chicago 2011; Hong Kong 2008; Turkey 2013; Philippines 2017	80%; 70%; 54.3%; 65.1%; 58%; 50.4%; 86.39%	7
Aspirin and other nonsteroidal anti-inflammatory agents are NOT effective analgesics for painful bone metastases. (False)	North Carolina 1999; Hong Kong 2004; Hong Kong 2008; Turkey 2013; Italy 2015; Palestine 2017; Saudi Arabia 2017	54%; 77.1%; 61.3%; 65%; 51.7%; 73.3%; 72.1%	7
Research shows that promethazine (Phenergan) and hydroxyzine (Vistaril) are reliable potentiators of opioid analgesics. (False)	North Carolina 1999; Chicago 2011; Turkey 2013; Jordan 2014; Italy 2015; Palestine 2017; Saudi Arabia 2018	82.5; 67.4%; 78.9%; 50.2%; 71.2%; 66.4%; 69.6%	7
What do you think is the percentage of patients who over report the amount of pain they have? (0%)	North Carolina 1999; Hong Kong 2004; Singapore 2005; Hong Kong 2008; Chicago 2011; Italy 2015	96.5%; 86.3%; 97%; 98.6%; 90%; 74.5%	6
Usual duration of action of meperidine IM is 4-5h;The usual duration of analgesia of 1-2 mg morphine IV is 4-5 hours; The usual duration of Pethidine is 4-5 hours. (False)	North Carolina 1999; Singapore 2005; Turkey 2013; Italy 2015; Palestine 2017; Saudi Arabia 2018	54.3%; 74.1%; 92.3%; 64.3%; 54.7%; 78.1%	6
Which of the following IV doses of morphine administered over a 4 hour period would be equivalent to 30 mg of oral morphine given q 4 hours? (morphine 10mg IV)	North Carolina 1999; Hong Kong 2008; Turkey 2013; Jordan 2014; Saudi Arabia 2018; Iraq 2020	56.7%; 57.8%; 60.2%; 59.7%; 74.9%; 59%	6

If the source of the patient's pain is unknown, opioids should not be used during the pain evaluation period, as this could mask the ability to correctly diagnose the cause of pain. (False)	Turkey 2013; Jordan 2014; Philippines 2017; Palestine 2017; Saudi Arabia 2018	74.5%; 62.6%; 87.66%; 80%; 80.2%	5
The recommended route administration of opioid analgesics for patients with brief, severe pain of sudden onset such as trauma or postoperative pain is (intravenous)	Singapore 2005; Hong Kong 2008; Turkey 2013; Jordan 2014; Italy 2015	49.2%; 55.9%; 67.5%; 50.2%; 73.4%	5
Non-drug interventions are very effective for mild to moderate pain control but are rarely helpful for more severe pain. (False)	North Carolina 1999; Hong Kong 2004; Singapore 2005; Hong Kong 2008; Italy 2015	54.7%; 84.4%; 84.3%; 74.8%; 71%	5
A patient with persistent cancer pain has been receiving daily opioid analgesics for 2 months. Yesterday the patient was receiving morphine 200 mg/hour intravenously. Today he has been receiving 250 mg/hour intravenously. The likelihood of the patient developing clinically significant respiratory depression in the absence of new comorbidity is (less than 1%)	North Carolina 1999; Turkey 2013; Jordan 2014; Saudi Arabia 2018; Iraq 2020	74.8%; 89.4%; 80.1%; 72.5%; 59%	5
Which of the following analgesic medications is considered the drug of choice for the treatment of prolonged moderate to severe pain for cancer patients? (morphine)	Singapore 2005; Hong Kong 2008; Turkey 2013; Iraq 2020	65%; 67.6%; 59.3%; 56%	4
Morphine has a dose ceiling (i.e. a dose above which no greater pain relief can be obtained). (False)	Singapore 2005; Hong Kong 2008; Jordan 2014; Palestine 2017	52.3%; 69.2%; 52.6%; 76.4%	4

Because their nervous system is underdeveloped, children under two years of age have decreased pain sensitivity and limited memory of painful experiences. (False)	Turkey 2013; Italy 2015; Palestine 2017; Saudi Arabia 2018	63%; 64.7%; 50.8%; 59.1%	4
Giving patients sterile water by injection (placebo) is a useful test to determine if the pain is real. (False)	Turkey 2013; Italy 2015; Saudi Arabia 2018; Iraq 2020	89.8%; 50.3%; 66.4%; 98%	4
Patients who can be distracted from pain usually do not have severe pain. (False)	Turkey 2013; Jordan 2014; Palestine 2017; Saudi Arabia 2018	72.8%; 64.6%; 69.7%; 55.5%	4
Aspirin 650mg PO is approximately equal in analgesic effect to meperidine (Demerol) 50mg PO. (True)	North Carolina 1999; Chicago 2011; Italy 2015	78.6%; 76%; 71.7%	3
Patients should be encouraged to endure as much pain as possible before using an opioid. (False)	Boston 1996; Jordan 2014; Palestine 2017	70%; 49.3%; 80.3%	3
Patient A: Your assessment, above, is made two hours after he received morphine 2 mg IV. Half hourly pain ratings following the injection ranged from 6 to 8 and he had no clinically significant respiratory depression, sedation, or other untoward side effects. He has identified 2/10 as an acceptable level of pain relief. His physician's order for analgesia is "morphine IV 1-3 mg q1h PRN pain relief." Check the action you will take at this time. (administer morphine 3 mg IV now)	Turkey 2013; Jordan 2014; Philippines 2017	91.1%; 90%; 88.94%	3
Patient B: Your assessment, above, is made two hours after he received morphine 2 mg IV. Half hourly pain ratings following the injection ranged from 6 to 8 and he had no clinically significant respiratory depression, sedation, or other untoward side effects. He has identified 2/10 as an acceptable level of pain relief.	Turkey 2013; Jordan 2014; Italy 2015; Philippines 2017	80.9%; 83.9%; 57.3%; 98.3%	3

His physician's order for analgesia is "morphine IV 1-3 mg q1h PRN pain relief." Check the action you will take at this time: (administer 3 mg IV now)			
Patient A: Andrew is 25 years old and this is his first day following abdominal surgery. As you enter his room, he smiles at you and continues talking and joking with his visitor. Your assessment reveals the following information: BP = 120/80; HR = 80; R = 18; on a scale of 0 to 10 (0 = no pain/discomfort, 10 = worst pain/discomfort) he rates his pain as 8. On the patient's record you must mark his pain on the scale below. Circle the number that represents your assessment of Andrew's pain. (8)	Turkey 2013; Jordan 2014	63%; 77.6%	2
Patient B: Robert is 25 years old and this is his first day following abdominal surgery. As you enter his room, he is lying quietly in bed and grimaces as he turns in bed. Your assessment reveals the following information: BP = 120/80; HR = 80; R = 18; on a scale of 0 to 10 (0 = no pain/discomfort, 10 = worst pain/discomfort) he rates his pain as 8. On the patient's record you must mark his pain on the scale below. Circle the number that represents your assessment of Robert's pain. (8)	Turkey 2013; Jordan 2014	56.9%; 58.3%	2
Anticonvulsant drugs such as gabapentin (Neurontin) produce optimal pain relief after a single dose. (False)	Turkey 2013; Saudi Arabia 2018	84.6%; 53.8%	2
Benzodiazepines are not effective pain relievers unless the pain is due to muscle spasm. (True)	Saudi Arabia 2018; Iraq 2020	52.6%; 58%	2

Analgesics for post-operative pain should initially be given (around the clock on fixed schedule)	Italy 2015; Iraq 2020	67.1%; 75%	2
Following abrupt discontinuation of an opioid, physical dependence is manifested by the following: (sweating, yawning, diarrhea, and agitation with patients when the opioid is abruptly discontinued)	Turkey 2013; Jordan 2014	63.8%; 82%	2
Which of the following is useful for treatment of cancer pain? (all of the above)	Jordan 2014; Iraq 2020	52.1%; 72%	2
Which of the following describes the best approach for cultural considerations in caring for patients in pain? (patient should be individually assessed to determine cultural influence)	Jordan 2014; Italy 2015	57.3%; 54.5%	2
How likely is it that patients who develop pain already have an alcohol and/or drug abuse problem? (5% - 15%)	Turkey 2013; Jordan 2014	70.7%; 71.6%	2
Vicodin/ Revacod (hydrocodone 5 mg + acetaminophen 500 mg) PO is approximately equal to 5-10 mg of morphine PO. (True)	Turkey 2013; Jordan 2014	89%; 58.3%	2
Narcotic/opioid addiction is defined as a chronic neurobiologic disease, characterized by behaviors that include one or more of the following: impaired control over drug use, compulsive use, continued use despite harm, and craving. (True)	Turkey 2013	80.5%	1
Children less than 11 years old cannot reliably report pain so clinicians should rely solely on the parent's assessment of the child's pain intensity. (False)	Saudi Arabia 2018	67.2%	1

After an initial dose of opioid analgesic is given, subsequent doses should be adjusted in accordance with the individual patient's response. (True)	Turkey 2013	73.2%	1
The time to peak effect for morphine given orally is (1 - 2 hours)	Jordan 2014; Palestine 2017	50.7%; 81.1%	1
Percent of time MD is called if patient still has pain	Boston 1996	62 %	1
To what degree do you think the cancer patient or family should control his/her treatment for pain (e.g. setting up the schedule for analgesics)? (more control than health professionals)	Boston 1996	84 %	1
Patient should expect total pain relief as a goal	Boston 1996	56 %	1
WHO pain ladder suggest using single analgesic agents rather than combining classes of drugs (False); Combining analgesics that work by different mechanisms (e.g. combining an opioid with an NSAID) may result in better pain control with fewer side effects than using a single analgesic agent. (True)	Turkey 2013	78 %	1
Heat and Cold should only be applied to painful area. (True)	Hong Kong 2008	64.3%	1
Patient should be advised to use non-drug techniques alone rather than use medications. (False)	Hong Kong 2008	64.3%	1
Analgesic therapy in chronic pain should be administered. (True)	Italy 2015	64.3%	1